Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

09 JUN 2003

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 E. Rodeo Park Drive, Bldg. 1
Santa Fe, NM 87505-6303

Subject: Notice of Planned Physical Alteration to the Waste Isolation Pilot Plant, Permit #NM4890139088-TSDF, Planned Site Improvements

Dear Mr. Bearzi:

The purpose of this letter is to notify the New Mexico Environment Department (NMED) Hazardous Waste Bureau of a planned physical alteration to the Waste Isolation Pilot Plant (WIPP), Hazardous Waste Facility Permit (HWFP) #NM4890139088-TSDF. This notice is being submitted by the U.S. Department of Energy (DOE), Carlsbad Field Office and Washington TRU Solutions, LLC (WTS) pursuant to 20.4.1.900 New Mexico Administrative Code (NMAC) (incorporating 40 CFR §270.30(l)), and Section I.E.11.a of the HWFP. The planned alteration does not compromise worker safety, human health, or the environment.

Specifically included with this notice is a copy of Discharge Plan 831 Modification Application, which was recently transmitted to the NMED's Ground Water Quality Bureau. The planned physical alteration to the facility involves reconfiguring the current salt storage area which will alter several facility surface features, including relocation of the storm water diversion berm located to the north of the salt storage area. The Permittees plan to carry out this facility alteration pending the Ground Water Quality Bureau's approval of the designs and specifications included in the Discharge Plan 831 Modification Application.

The location of the existing storm water diversion berm, and its planned relocation, is depicted on Drawing 3 included with the enclosed Discharge Plan 831 Modification Application. The Permittees believe that this physical alteration will not affect any condition or provision in the HWFP.

If you have any questions regarding this notice, please contact Mr. Harold Johnson at (505) 234-7349.

Sincerely,

Inés Triay

Dr. Inés R. Triay, CBFO Manager
U.S. Department of Energy

Steven D. Warren

Steven D. Warren, General Manager
Washington TRU Solutions, LLC

Enclosure

CBFO:OEC:DE:VW:03-2033:UFC:5486

030608

cc: w/o enclosure
S. Zappe, NMED
M. Menetrey, NMED

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 2 5 2003

COPY

Ms. M. A. Menetrey, Program Manager
Mining Environmental Compliance Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87505

Subject: Discharge Plan 831 Modification Application

Dear Ms. Menetrey:

In response to the December 30, 2002 letter from Ms. Marcy Leavitt, of the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB), to Dr. Inés Triay, of the Waste Isolation Pilot Plant (WIPP), Carlsbad Field Office (CBFO), WIPP is submitting a discharge plan (DP) application modification for the mining operations at WIPP. The CBFO, pursuant to Section 20.6.2.3106.B of the Water Quality Control Commission Regulations, will be requesting temporary permission to discharge an additional 120 days under a separate letter.

The purpose of the enclosed application is to modify the existing DP-831 to cover discharge associated with the salt storage operations at WIPP. The application includes plans and specifications of facility operations not addressed in previous DP-831 applications and renewals. Where applicable, the DP-831 modification application refers to previous submittals to the GWQB, in lieu of submitting this information again. Additionally, the modification application refers to specific sections in the Notice of Intent (NOI) submitted to the GWQB on October 30, 2002 (WIPP NOI 2002). Excerpts from the NOI have been included as attachments to the modification application where appropriate.

As explained at the April 1, 2003 briefing between representatives of the WIPP and the GWQB, WIPP's approach to the modification application involves aggressive source, infiltration, and migration reduction and control measures. The design of the source control measures has been amended to include extension of a synthetically lined salt storage area, a new double lined Salt Storage Extension basin, single synthetically lined salt pile basin, Evaporation Basin A, Evaporation Basin B, and capping the existing salt pile. This approach is expected to eliminate solute and water infiltration and reduce the hydraulic head of the shallow subsurface water.

The DP-831 modification application includes associated figures and attachments. Attachment A includes the design basis and specifications for the system conveyance, collection, treatment, and distribution systems. Attachments B and D contain specific excerpts from the NOI delivered to the GWQB in October 2002. Attachment C includes recent water level measurements for the WIPP site. Attachment E contains specific responses to questions posed in the December 31, 2002 letter from NMED GWQB to the WIPP. Attachment E also contains figures requested in the GWQB's December 31, 2002 letter.

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CBFO:OEC:DE:VW:03-0383:UFC:5400

APR 25 2003

If you have any questions regarding the enclosed application, please contact David Emery of my staff at (505) 234-7475.

Sincerely,

Inés Triay

Dr. Inés R. Triay
Manager

Enclosure

cc: w/o enclosure
D. Emery, CBFO
CBFO M&RC

CBFO:OEC:DE:VW:03-0383:UFC:5400

Discharge Plan 831 Modification Application

Waste Isolation Pilot Plant
Carlsbad, New Mexico

April 24, 2003

BILL RICHARDSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965
www.nmenv.state.nm.us

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

GROUND WATER DISCHARGE PERMIT APPLICATION

Enclosed is a Ground Water Discharge Permit Application Form (Form) and checklist. Section 20.6.2.3104 NMAC of the NM Water Quality Control Commission Regulations (20.6.2 NMAC) requires that any person proposing to discharge effluent or leachate so that it may move directly or indirectly into ground water must have an approved discharge permit, unless a specific exemption is provided for in the Regulations. The enclosed Form is a general guideline for use by applicants to ensure that an application is complete and provides all of the information required by sections 20.6.2.3106, 20.6.2.3107, 20.6.2.3108, and 20.6.2.3109 NMAC.

Mail **three complete copies** of your application with a **$100 filing fee** check made payable to the New Mexico Environment Department (NMED) at the address below:

Maura Hanning, Program Manager
Ground Water Pollution Prevention Section
NM Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Pursuant to Regulation 20.6.2.3108 NMAC, NMED will, within thirty (30) days of deeming the application administratively complete, publish a public notice and allow 30 days for public comment before taking final action on a discharge permit. A public hearing will be held if NMED determines that there is significant public interest. It takes approximately180 days to process a complete application and issue a discharge permit if no public hearing is held.

All applications must be accompanied by a filing fee of $100. **An additional fee will be assessed prior to permit issuance** to cover the estimated cost to the NMED for investigation, and, issuance of the permit. **Permit fees are listed in the Regulation 20.6.2.3114 NMAC.**

If you have any questions about this discharge permit application, call the Ground Water Pollution Prevention Section at 505-827-2900

COMPLETION CHECKLIST

☑	All portions of the Ground Water Discharge Permit Application Form have been addressed. (The application will not be considered complete if there are omissions, which will delay publication of the public notice and issuance of the permit.)
☑	Submitter has included operational, monitoring, contingency, and closure plans that are appropriate for the proposed treatment and disposal system, and meet the site-specific conditions for the proposed facility.
☑	Plans and specifications for the entire effluent or leachate conveyance, collection, treatment, distribution, and disposal system have been included as required by Regulation 20.6.2.1202 NMAC. For septic tank/leachfield systems, designs should be consistent with NMED's guidelines for Plans and Specifications for Discharge Permit Applications Using Septic Tank/Leachfields.
☑	The application has been signed and dated by the responsible party, generally the owner or lessee.
☑	If your facility site includes an archeological site on the State Register of Cultural Properties or National Register of Historic Places, the State Historic Preservation Office has the authority to require an archeological or historical study prior to NMED taking final action on your discharge permit.
☑	Four maps have been included: **1)** area United States Geological Survey (USGS) topographic map that includes the location of the facility and all of the information required in the application item 7.b, **2)** local road map clearly defining the location of the facility and the route to get to the facility, **3)** detailed site map that includes all discharge locations (lagoons, leachfields, land application areas, outfalls...), all water supply and monitoring wells, all water courses on the property and all buildings and **4)** United States Department of Agriculture (USDA) soils map. **Note: Previously submitted with DP-831 applications and renewals.**
☑	Three copies of all required information have been enclosed.
☐	A filing fee check in the amount of $100, has been enclosed, made payable to the NM Environment Department at the address on page 1. **Note: Funding for this modification application has been submitted under separate cover with the funding for the DP-831 renewal application.**
☑	The SUMMARY OF APPLICANT'S PUBLIC NOTICE REQUIREMENTS has been reviewed and the option for Public Notice Has been selected on the application page 3.

ADMINISTRATIVE COMPLETENESS

To be deemed administratively complete for publication of a public notice, the following information must be provided. [20.6.2.3106, 20.6.2.3108 NMAC]

Review the SUMMARY OF APPLICANT'S PUBLIC NOTICE REQUIREMENTS (attached) to select an option below.

☐ Public Notice Option 1 ☑ Public Notice Option 2 ☐ Public Notice Option 3

1. **Name of the proposed discharger and facility** [20.6.2.3106, 20.6.2.3108.C.1 NMAC]:

Type of facility or operation (dairy, municipal wwtp, mining, school, etc.):

The Waste Isolation Pilot Plant (WIPP) is currently permitted to discharge into synthetically lined systems at the facility as defined in Discharge Permit (DP) 831. These permitted WIPP facilities include the facultative lagoon system and the H-19 evaporation pond. The facultative lagoon system is made up of seven synthetically lined ponds (two settling, two finishing, and three evaporation ponds, A, B, C) for treatment of sewage effluent, neutralized acid, and non-hazardous brine water. The H-19 evaporation pond receives non-hazardous brine water for treatment.

The purpose of this application is to modify the existing DP-831 permit to cover the discharge associated with the salt storage operations at WIPP, as described in the October 30, 2002 Notice of Intent. The following is a description of the facility and current salt storage operations.

The Waste Isolation Pilot Plant (WIPP) is a hazardous and radioactive waste disposal facility operated by the U.S. Department of Energy (DOE). It is designed, permitted, and operated for the receipt of defense generated TRU and TRU mixed waste. The WIPP is constructed in a bedded salt deposit 2150 feet beneath the earth's surface. Hazardous Waste Disposal Units are excavated in the bedded salt as permitted by the New Mexico Environment Department (NMED) with the issuance of Hazardous Waste Facility Permit (HWFP) #NM4890139088-TSDF, October 27, 1999. The excavated salt is stored on the surface for authorized disposition at closing of the WIPP. This pile, or salt pile (SP), is approximately 17 acres in size and has an associated salt pile evaporation pond (SPEP) that is approximately 3.5 acres. The SP is surrounded with ditches that divert runoff from the SP to the SPEP (referred to as the Salt Pile Runoff Ditches (SPRD). The SP, SPRD, and SPEP are the subject of this application (Figure 1). All of these units (SP, SPRD, SPEP) are collectively defined as the Salt Storage Area (SSA). The current design and operation of the SSA are described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002).

	Name	Address*	City	State	Zip	Telephone & Fax
Facility*	Waste Isolation Pilot Plant	26 miles E-SE of Carlsbad, NM	Carlsbad	NM	88221	505-234-7200
Owner	U.S. Department of Energy Ines Triay DOE/CBFO Manager	P.O. Box 3090	Carlsbad	NM	88221	505-234-7300 505-234-7027
Responsible Party	Bruce Lilly, DOE/CBFO Dave Reber, WTS	P.O. Box 3090	Carlsbad	NM	88221	505-234-8136 505-234-7027 505-234-8799 505-234-6082
Facility Representative	Bruce Lilly, DOE/CBFO Dave Reber, WTS	P.O. Box 3090	Carlsbad	NM	88221	505-234-8136 505-234-7027 505-234-8799 505-234-6082
Consultant	N/A	N/A	N/A	N/A	N/A	N/A
Other (specify)	N/A	N/A	N/A	N/A	N/A	N/A

*For the facility address, enter physical address- not mailing address.

2. <u>Locations of the Discharges</u> [20.6.2.3106.C.2 and 20.6.3108.C.2 NMAC]:

List the locations of the discharges covered by this permit. Add rows as necessary to include all discharge locations. Sections should be described to the nearest ¼ of a ¼ of a ¼ section (please see attachment).

Discharge Location (lagoons, leachfields, land application areas, outfalls, etc.)	**County**	**Township**	**Range**	**Section**	**Latitude**	**Longitude**
Salt Storage Area	**Eddy**	**22S**	**31E**	**SE, NW, SW 20**	**32°22'27"N**	**103°47'45"W**

3. Brief Description of Discharge [20.6.2.3108.C.3 NMAC]:

Briefly describe the activities which produce the discharge(s) including the treatment and disposal methods. Attach additional pages as necessary.

The SP and SPEP were constructed in 1984. The current configuration and operation of the SP/SPEP is generally described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002). The SP area is approximately 17 acres and the SPEP area is approximately 3.5 acres as shown in Figure 1 attached to this application. The discharge from the SP to the SPEP is associated with precipitation events.

Storm water samples collected from the SPRD (these ditches have also been referred to as the SP "moat") and SPEP in 1997 showed total dissolved solids (TDS) concentrations of 9,320 mg/L and 2,630 mg/L, respectively (WIPP NOI 2002, Attachment 4).

Source control activities were described in Section 5.0 of the October 30, 2002 NOI and preliminary design specifications were included in Attachment 10. Source control activities continue to focus on prevention of water infiltration, and dissolution of solutes (salt) to the subsurface.

See Design Basis Summary with Drawings 1-12 (included as Attachment A), which describes the proposed source control design for the SSA.

4. Discharge Characteristics [20.6.2.3106.C.1 and 20.6.2.3108.C.4 NMAC]:

4.a. Quantity:

Peak design discharge rate* in gallons per day (gpd) (design capacity of the treatment and disposal system):	**SPEP: 432,000 cubic feet (cf)** **SSE: 251,000 cf**
Average discharge rate on annual basis in gpd (actual flow):	**SPEP: 178,886 cf** **SSE: 87,643 cf**
Methods used to meter or calculate discharge volume:	**See Attachment A, Appendix A.1**

*Peak design discharge rate is the maximum volume of wastewater the system was designed to treat on a daily basis. This is generally based on the capacity of the different components of the system (size of lagoons, volume of tanks, etc.)

4.b. Quality: Add rows as necessary to include all contaminants and toxic pollutants.

Contaminant(s) or Toxic Pollutant(s) generally associated with facility type (contaminants of concern are listed in 20.6.2.7. and 20.6.2.3103 NMAC)	**Influent Concentration (mg/L)**	**Effluent Concentration (mg/L)**
Total Dissolved Solids (TDS)	**2,630 mg/L and 9,320 mg/L [1]**	**NA**

1 **Concentrations represent analytical results of storm water samples obtained in 1997 from the SPEP and SPRDs (WIPP NOI, 2002, Page 3). Excerpts from the WIPP 2002 NOI and associated references are attached to this application (Attachment B)**

4.c. Flow Characteristics:

Number of days per week discharge occurs:	**7 days [1]**
Number of months per year discharge occurs (specify months):	**12 months [1]**
Is flow continuous or intermittent:	**Intermittent**

1 **Flow is associated with precipitation and is intermittent, but could occur on any day of the week or month of the year.**

5. <u>Ground Water Conditions</u> [20.6.2.3106.C.3 and 20.6.2.3108.C.5 NMAC]:

Sources for this information may be the New Mexico State Engineers Office, NMED, GWPPS web site (www.nmenv.state.nm.us), and USGS reports. If you do not have a TDS value, take a sample from the nearest well to the discharge location and submit the results from the analysis.

Depth to ground water below the discharge site:	**608 feet [1 & 2]**
Flow direction of ground water below the site:	**West**
Flow gradient of ground water below the site:	**0.0026 feet/feet**
Reference* or source for depth, direction and gradient:	**See footnote below [1]**

[1] The closest groundwater below the SSA occurs in the Magenta Member of the Rustler Formation at approximately 608 feet below ground surface (bgs). Due to pressure in the formation, water levels measured in wells completed in the Magenta rise to the potentiometric surface, approximately 315 feet bgs at the discharge site. The hydraulic gradient was generated from depth to water measurements from wells completed in the Magenta Member (H-10a, H-6c) near the discharge site (Figure 2). Underneath the SSA, the potentiometric surface is interpolated to be approximately 315 feet bgs. Depth to water measurements were obtained during January 2003 (See attachment C to this application).

[2] In accordance with NMAC 20.6.2.3106 (c) (3), which states "Depth to and TDS concentration of the ground water most likely to be affected by the discharge,", and as described in Section 4.4.2 of the October 30, 2002 NOI, natural Dewey Lake Redbeds groundwater exists in well WQSP-6A approximately 6,600 feet southwest of the SSA, and approximately 167 feet below ground surface at the WQSP-6A location. Natural Dewey Lake Groundwater does not exist beneath the SSA. TDS values measured in WQSP-6A have consistently remained stable at approximately 4,000 mg/L (WIPP 2002 NOI Section 4.4.2 and Table 2)

* If determined from well logs, please provide photocopies of well logs with application. If depth is derived from a report, include copies of appropriate pages and complete reference to report including author, title, and publication date.

Total Dissolved Solids (TDS) concentration (mg/L) of ground water below the site:	**Ranges from 4,600 to 24,600 mg/l [1]**
Reference or source for TDS:	**WIPP Compliance Certification Application, Appendix USDW.3.3.3 [1]**

[1] TDS concentrations for Magenta wells were reported in the Title 40 CFR 191 Compliance Certification Application (CCA) for the Waste Isolation Pilot Plant. The values for TDS ranged from 4,600 mg/l in well H-06c to 24,600 mg/l in well H-04c. Well H-06c is located in the northwest quadrant on the border of the Land Withdrawal Act (LWA) boundary while well H-04c is located on the southwest quadrant of the LWA boundary (Figure 2).

TDS concentrations in Natural Dewey Lake Redbeds groundwater have ranged from 3,800 mg/L to 4550 mg/L (WIPP 2002 NOI, Table 2). This natural groundwater in the Dewey Lake does not exist beneath the discharge site as discussed above.

TECHNICAL ADEQUACY

To be deemed technically adequate for purposes of issuing the discharge permit, the following information must be provided [20.6.2.3106, 20.6.2.3107, 20.6.2.3109 NMAC]. Operational, monitoring, contingency, and closure plans must be submitted and must be appropriate for the proposed treatment and disposal type and meet the site specific conditions for the proposed facility.

6. Permit Plans [20.6.2.3106.C.7, 20.6.2.3107.A, and 20.6.2.3109.C NMAC]:

6.a. Operational Plan [20.6.2.3106.C.7 and 20.6.2.3109.C NMAC]:

The operational plan must describe how the system(s) for conveyance, collection, treatment, distribution, and disposal of wastewaters or other discharges will be constructed, operated, inspected, and maintained. The operational plan must demonstrate that ground water standards will not be exceeded.

6.a.i. In the following table, identify all proposed conveyance, collection, treatment distribution, and disposal units included in the operational plan. Add rows as necessary to include all units.

Treatment/Storage/ or Disposal Unit **Treatment units** (lagoon, mechanical treatment plant, manure separator, clarifier, etc.) **Disposal Units** (land application area, leachfield, evaporative lagoon, leachstockpile, etc.)	**Construction Material**	**Volumetric Capacity*/Area*** (gallons or cubic yards/ acres)
See design plans and specifications in Attachment A to this application	**See design plans and specifications in Attachment A to this application**	**See Attachment A to this application**

*Volumetric Capacity must be provided for all tanks, chambers, and impoundments or other storage units.
*Area must be provided for all land application areas, leachfields or other area features.

6.a.ii. Describe in detail the operational plan, including all conveyance, collection, treatment, distribution and disposal systems. Attach additional pages as necessary:

The current configuration and operation of the SP/SPEP is generally described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002). The description of the proposed design conveyance, collection, and treatment systems for the SSA is included in the Design Basis Summary in Attachment A to this application.

6.a.iii. Describe the operations and maintenance plan that will be followed to ensure the system is maintained as described. At a minimum the plan must include monthly inspections of all wastewater treatment and disposal units. Attach additional pages as necessary.

The current configuration and operation of the SP/SPEP is generally described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002). The SSA will be inspected monthly, and following severe rainstorms, for damage and impediments to water flow. Inspections will include, but are not limited to, identification of liner wear, erosion, animal damage, vehicular damage, buildup of salt, soil, debris, and/or vegetation, that may impede designed water flow. Upon identification of unusual operation or defects in the system, corrective action will be initiated to correct any discrepancies or deteriorating conditions.

6.b. Monitoring Plan [20.6.2.3106.C.5 and 20.6.2.3107.A.1-9 NMAC]:

The monitoring plan must describe how the facility will be monitored to ensure that the discharge will not adversely impact ground water quality. The plan must include all monitoring locations (effluent sampling, monitoring wells, lagoons, soil sampling, plant tissue analysis, etc.). Monitoring locations must be included on the facility map.

6.b.i. Monitoring Locations. In the following tables, identify all monitoring locations. Add additional rows as necessary to include all monitoring locations.

Flow, Effluent and Ground Water Monitoring

Monitoring Location	**Lat**	**Long**	**Elevation**	**Sampling Frequency per year**	**Reporting Frequency per year**	**Water or Soil Contaminant Type** (please refer to 20.6.2.7.uu, and 20.6.3103 NMAC)
NA	NA	NA	NA	NA	NA	NA

*Identify the sampling locations as designated or named by the facility.

Soil, Plant Tissue and Other Sampling

Monitoring Location*	Lat	Long	Sampling Frequency per year	Reporting Frequency per year	Water or Soil Contaminant Type
Land application area soil sampling	N/A	N/A	N/A	N/A	N/A
Land application area plant tissue analysis	N/A	N/A	N/A	N/A	N/A
Other	N/A	N/A	N/A	N/A	N/A

N/A: Not Applicable

6.b.ii. Describe in detail the sampling protocols that will be used for sample collection at all monitoring locations. Attach additional pages as necessary.

As described in the WIPP October 2002 NOI (WIPP NOI 2002, Section 6.2), water level monitoring and water quality sampling for the SSW beneath the WIPP surface facilities will continue in the shallow monitoring wells and piezometers under the current schedule. Currently, the water quality sampling plan (WQSP) wells (including WQSP-6A) are sampled semi-annually and water levels measured monthly in accordance with the HWFP. The piezometer network is sampled annually and water levels are obtained monthly. This will continue until such time as the results from the Site Investigation Work Plan suggests that the monitoring be adjusted (WIPP NOI 2002, Attachment 11). Currently, the water levels in the shallow monitoring wells and piezometers are measured once per month. Water quality samples are obtained and analyzed once per year from these sample locations.

The protocol for the 16 SSW wells and piezometers will follow low-flow sampling techniques as described in the New Mexico Environment Department (NMED) guidance titled *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Monitoring.* Purging for these wells will consist of low flow pumping of the well such that the decrease in hydraulic head is equivalent to the rate at which water is removed from the well. Purged water will be routed through Tygon™, or similar type, tubing into an approved flow-through cell, where serial samples will be obtained. Field indicator parameter sampling will be performed with a multi-meter instrument capable of measuring dynamic, in situ changes in pH, specific conductance, temperature, and dissolved oxygen. Final samples will be obtained after indicator parameters have stabilized over three consecutive readings spaced a minimum of five minutes apart. SSW samples will be analyzed for parameters listed in the Table 1 of the WIPP 2002 NOI and Attachment D of this application

6.b.iii. Standard Monitoring Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

☐ All monitoring wells will be installed according to NMED Monitoring Well Construction and Abandonment Guidelines (copy enclosed)

☑ All monitoring wells (if 3 or more monitoring wells are on site) will be surveyed to a common permanent benchmark and that the survey will be submitted to the NMED, GWQB within 60 days of installation of all monitoring wells. Survey data will include northing, easting, and elevation to the nearest hundredth of a foot. One of the wells may be used as the benchmark.

☑ This facility will measure the depth to ground water in each monitoring well to the nearest hundredth of a foot prior to purging and sampling, and that three well volumes will be purged from each monitoring well prior to sample collection.

☐ This facility will complete land application data sheets (LADS, copy enclosed) documenting the amount of nitrogen applied to each land application area if applicable. The LADS will incorporate the wastewater volume and analytical results of the wastewater testing to determine total nitrogen applied to each field. **Not Applicable**

6.c. Contingency Plan [20.6.2.3107.A.10 NMAC]:

The contingency plan must describe the actions to be taken if Regulation 20.6.2.3103 NMAC ground water standards are exceeded or if toxic pollutants are present (20.6.2.7.uu) as a result of discharges regulated under the proposed permit, and to cope with failure of the discharge permit or system.

6.c.i. Standard Contingency Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

☐ This Facility will comply with the following contingency language:

In the event that monitoring indicates ground water standards are violated or may be violated during the term of the discharge permit or upon post closure monitoring, this facility will collect a confirmation sample from the monitoring wells within 15 days to confirm the initial sampling results. Upon confirmation of contamination, all ground water monitoring will be conducted monthly and a corrective action plan will be submitted to the NMED. The corrective action plan will include a site investigation to define the source, nature and extent of ground water contamination, and a proposed abatement option; and a schedule for implementation. The site investigation and abatement option must be consistent with the requirements and provisions of Regulations 20.6.2.4101, 20.6.2.4103, 20.6.2.4106.E, 20.6.2.4107, and 20.6.2.4112 NMAC. The corrective action plan will be submitted to NMED for approval within 30 days of confirmation of ground water contamination, and will be initiated within 30 days of NMED approval. **See note below.**

Note: The October 30, 2002 NOI describes the planned site investigation activities to assess the lens of shallow subsurface water (WIPP NOI 2002, Section 6 and Attachment 11).

☑ This facility will comply with the following contingency language:

In the event of a spill or release that is not as prescribed in the approved discharge permit, this facility will take immediate corrective action to contain or mitigate the damage caused by the discharge and will initiate the notifications and corrective actions as required by Regulation 20.6.2.1203 NMAC. Within 24 hours discovery of the incident, this facility will verbally notify NMED and provide the information outlined in Regulation 20.6.2.1203.A.1. NMAC. Within 7 days of discovering the incident, this facility will submit a written verifying the oral notification and providing any additional pertinent information or changes. Within 15 days of the incident, this facility will submit a corrective action plan describing actions taken and/or to be taken to remedy the impact of the unauthorized discharge.

6.c.ii. Specific Contingency Plan:

Describe any additional specific corrective actions or contingencies that will be taken to cope with failure of the discharge system: Attach additional pages as necessary.

Specific contingency planning includes monthly inspection and repair of the SSA system liners as necessary, containment and investigation of all spills and releases. In the event of a tear in a liner that results in a release to the environment, an effluent spill or unauthorized discharge, the Ground Water Quality Bureau will be notified pursuant to the standard permit condition 6.c.i. The Permitee will assess damages and attempt to isolate any discharge, and corrective measures will be implemented immediately.

6.d. Closure Plan [20.6.2.3107.A.11 NMAC]**:**

The closure plan must describe the closure actions to be taken to prevent Regulation 20.6.2.3103 NMAC ground water standards from being exceeded, or the introduction of a toxic pollutant in ground water after cessation of operations. At a minimum, the closure plan must include a description of closure measures, post closure monitoring plans, and financial assurance (if required by NMED).

6.d.i. Specific Closure Plan: Describe the specific closure activities to ensure that ground water quality will be protected after cessation of operations. The plan shall include plugging, removal, and/or filling of all conveyance, collection, treatment, distribution and disposal features in order to prevent future discharges at the facility. The plan must also describe how all liquid and solid wastes will be removed and disposed of according to local, state, and federal laws. The plan must also describe how disturbed areas will be backfilled to blend with the original surface topography to prevent future ponding and to prevent a discharge at the facility from occurring after the cessation of operations. Attach additional pages as necessary.

The closure plan dated December 16, 1996 will be implemented when the facility is decommissioned. The plan includes the pumping or evaporation of all wastewater ponds, removal of all solids, and recontouring and revegetation of the site. In addition, all basin liners will be removed or perforated upon closure of the site. This will be performed to comply with Section 20.6.2.3107.A.11 NMAC.

6.d.ii. Standard Closure Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

This facility will comply with the following closure requirements:

☑ The discharger will notify NMED at least 30 days prior to cessation of operations and will provide a schedule for implementation of the closure plan.

☐ This facility will conduct post closure monitoring at the frequency and locations prescribed under the active permit for a period approved by NMED. If Regulation 20.6.2.3103 NMAC ground water standards are violated or toxic pollutants are present during post closure monitoring, this facility will implement the contingency plan required in the active permit.

☑ All monitoring wells will be plugged and abandoned in accordance with NMED Monitoring Well Construction and Abandonment Guidelines once NMED has agreed in writing that post closure ground water monitoring may cease.

☑ Once NMED has approved all closure activities, this facility will submit a letter requesting termination of the discharge permit.

TECHNICAL SUPPORT

The following information must be submitted as required by Regulation 20.6.2.3106, and 20.6.2.3109 NMAC.

7. **Other Discharge Locations** [20.6.2.3106.C.2 NMAC]:

7.a. List the locations of any other discharges at this facility not covered by this permit but permitted under the New Mexico Liquid Waste Disposal Regulations, Hazardous Waste Management Regulations, Federal Clean Water Act (NPDES), and any un-permitted discharges. Add rows as necessary to include all other discharge locations.

Discharge Type (septic tank/leachfields, surface water discharges, etc.)	**Permit Identification**	**Discharge Location Description**
Facultative Lagoon System and evaporation facility	**DP-831**	**23,000 gpd of sewage effluent and 2,000 gpd of non-hazardous brine**
H-19 Evaporation Pond	**DP-831**	**8,000 gpd non-hazardous brine water to north evaporation cell**

7.b. **Area Map:** On the appropriate United States Geological Survey (USGS) 7.5 minute topographic quadrangle map, identify the location of all water supply wells, injection wells, seeps, springs, bodies of water, and watercourses within one mile of the outside perimeter of the discharge site.

As described in Section 8 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, previous applications, renewals, and modifications, there are no water supply wells, injections wells, seeps, springs, bodies of water, or watercourses within one mile of the outside perimeter of the discharge site.

8. **Flooding Potential** [20.6.2.3106.C.4 NMAC]:

8.a. Describe the flooding potential of the discharge site based on the latest Federal Emergency Management Agency flood plain map or site specific analysis:

As described in Section 12 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, the flooding potential of the WIPP facility is considered minimal since the general ground elevation in the vicinity of the surface facilities is approximately 400 feet above the 100 year floodplain of the Pecos River, which is the closest river to the facility. The potential for flash flooding is considered minimal because of the high percolation rate of the surrounding sand dunes and the flood protection berms (see Section 8.b of this application).

Source for Information: **WIPP DP-831 Renewal Permit Application, December 16, 1996**

8.b. Describe the methods used to control flooding, run-on and run-off at the discharge site (berms, diversion channels, etc.):

As described in the October 30, 2002 Notice of Intent, a berm exists along the north side of the SP/SPEP facility and is contoured such that rainfall will be diverted around the berm to the west, and around the SPEP (WIPP NOI 2002, Attachment 2). This berm will be relocated as a result of the Salt Storage Extension (SSE), however the integrity will be retained. See the description of the berm in the Design Basis Summary and specifications in Attachment A to this Application.

9. Geologic and Soil Information [20.6.2.3106.5 NMAC]:

9.a. Lithology: Describe the lithology and thickness of each geologic unit below the discharge site and indicate which units bear water. This information may be obtained from a driller's log or geologic report. Include photocopies of all well logs with the application. Add rows as necessary to include all units.

The geologic units below the discharge site (SP/SPEP area) are described in the October 30, 2002 Notice of Intent (WIPP NOI 2002, Section 4.0, and NOI Attachments 3,4,5,6,7, and 11). These descriptions include lithology, thickness, and hydrogeologic properties of the unit below the discharge site.

Source for Information: **October 30, 2002 Notice of Intent (WIPP NOI 2002, Section 4.0, and Attachments 3, 4, 5, 6, 7, and 11)**

9.b. Soil Map: Attach a copy of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey map and descriptive information for soil(s) associated with the discharge site.

Previously provided in Attachment 9 of the WIPP Discharge Plan DP 831 Renewal Application, dated December 16, 1996.

10. Signatures:

Owner: I certify that I am the legal owner of the property in which all discharges will occur. I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: ______________________________

Signature: ______________________________ Date ____________________

Responsible Party* (if property is leased or operated by someone other than the owner):

I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: ______________________________

Signature: ______________________________ Date ____________________

* Enclose a signed copy of the lease agreement between the responsible party and the owner of the property on which the proposed discharge will occur. Lease agreement should be valid for the duration of the discharge permit or until the discharge permit is modified to reflect a new lessee.

LIST OF FIGURES FOR THIS DP MODIFICATION APPLICATION

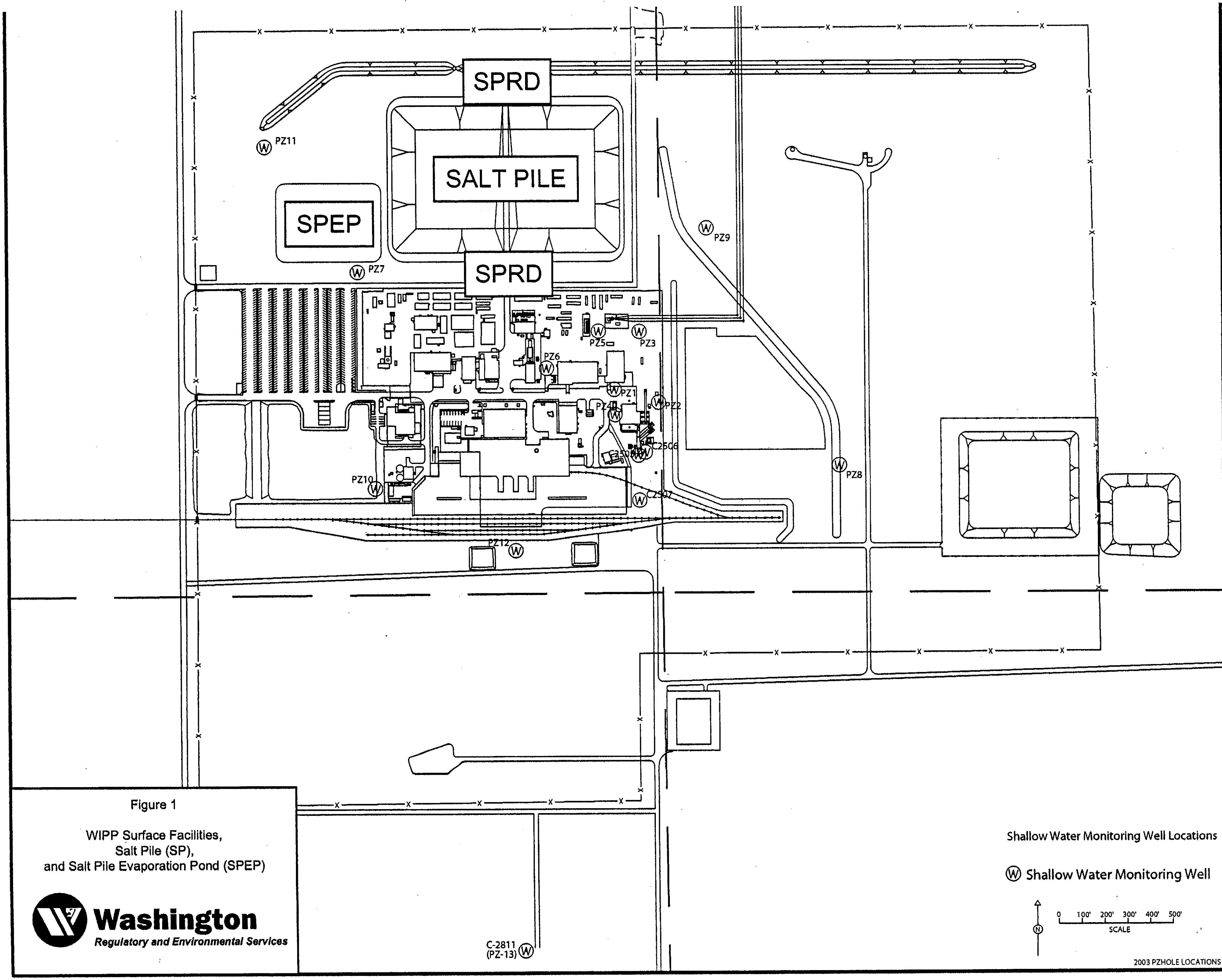

Figure 1

WIPP Surface Facilities,
Salt Pile (SP),
and Salt Pile Evaporation Pond (SPEP)

Washington
Regulatory and Environmental Services

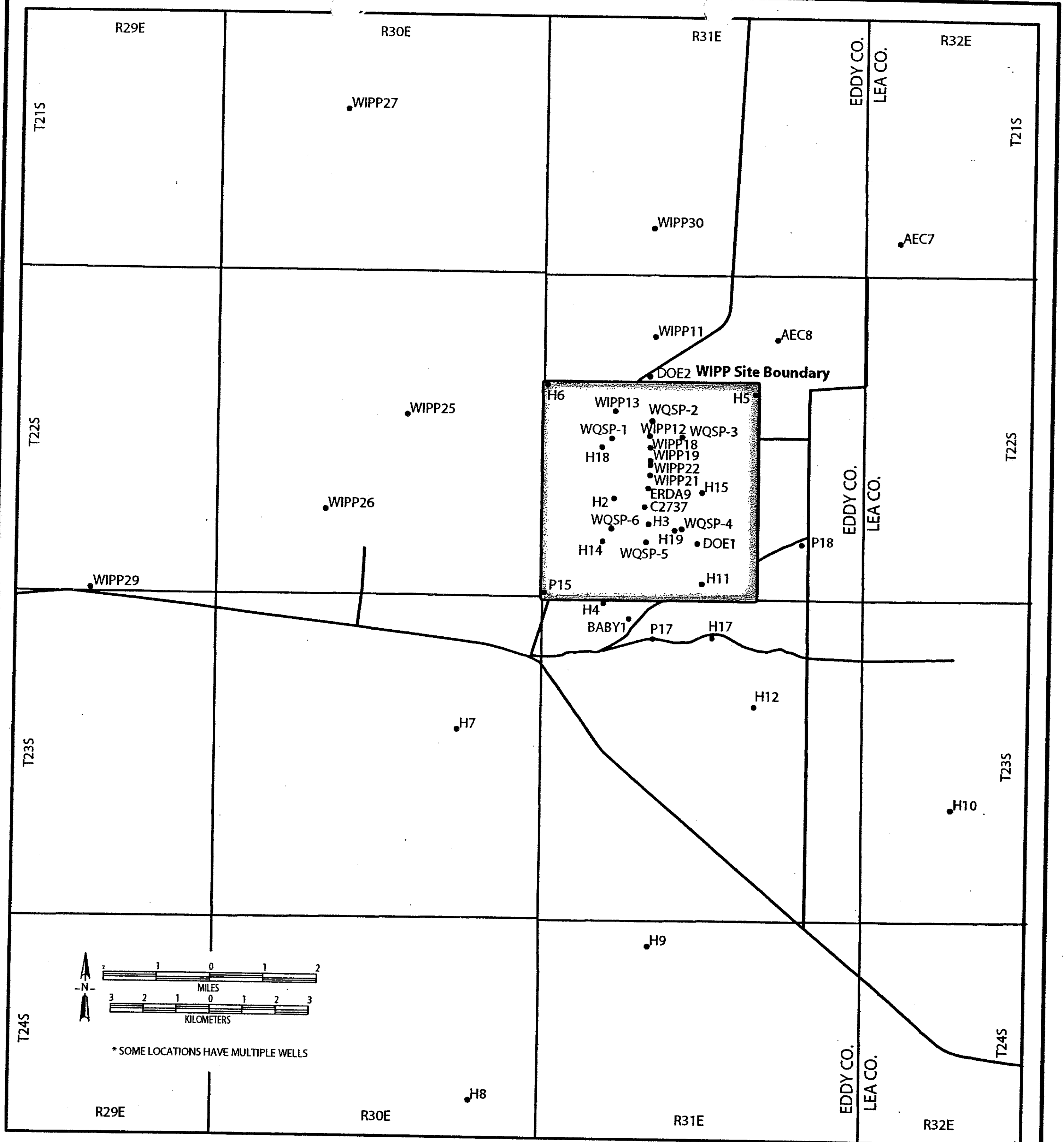

Figure 2

WIPP Vicinity and Well Locations

Washington
Regulatory and Environmental Services

ATTACHMENTS

A. Design Basis Summary: Conceptual Design for Infiltration Controls (including Drawings 1-12).

B. Excerpts from WIPP 2002 NOI Attachment 4, "Exhaust Shaft: Phase 2 Hydraulic Assessment Data Report Involving Drilling, Installation, Water-Quality Sampling, and Testing of Piezometers 1 – 12", 1997 surface water TDS measurements from Salt Pile Evaporation Pond and Salt Pile Run-off Ditches.

C. Water Level Measurements for January 2003.

D. Excerpt from WIPP 2002 NOI, Table 1, Analytical Results for Shallow Subsurface Water, December, 2001.

E. Response to hydrogeological questions posed in the December 31, 2002 letter from C. Marshall of New Mexico Environment Department (NMED) Ground Water Quality Board (GWQB) to I. Triay of WIPP CBFO.

ATTACHMENT A

Design Basis Summary: Conceptual Design For Infiltration Controls (including Drawings 1-12)

WASTE ISOLATION PILOT PLANT
CONCEPTUAL DESIGN FOR INFILTRATION CONTROLS

APRIL 2003

ATTACHMENT A:

DESIGN BASIS SUMMARY

PREPARED FOR:

CTAC

DOE/CBFO

PREPARED BY:

Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004
(505) 867-6990
Fax (505) 867-6991

ATTACHMENT A

DESIGN BASIS SUMMARY:
WIPP Infiltration Controls
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Drawing Index

1.0 PROJECT OBJECTIVES

Historical stormwater management practices may have contributed to Shallow Subsurface Water (SSW) conditions beneath the WIPP site. Storage of mined salt in the Salt Pile (SP) is likely responsible for elevated total dissolved solids (TDS) in the SSW. Infiltration of salt contact water has occurred through the SP and its associated run-off control systems:

- The Salt Pile Run-Off Ditches (SPRD's)
- The Salt Pile Evaporation Pond (SPEP)

Stormwater run-off exclusive of the Salt Storage Area (which includes the SP, SPRD's, and SPEP) is currently collected and managed in three unlined detention basins. This run-off mostly from the roofs and paved areas, may represent a third of the stormwater that is available to recharge the SSW.

The purposes of the proposed infiltration control systems are to:

1. Eliminate the potential for future salt infiltration .
2. Control and Evaporate nearly 100% of the site's stormwater run-off .

The priorities are to address the greatest potential contributors of TDS first; and stormwater second. As shown on **Table A.1**, the controls associated with the Salt Storage Area (SSA) and SPEP will address 100% of the salt infiltration; and an estimated 60% of the recharge. The current Salt Pile will be reshaped and capped with a geomembrane liner, with an additional 2′ thickness of vegetative soils to protect the liner and stabilize the cap (Section 2.1). The SPRD's and SPEP will also be lined with high-density polyethylene (HDPE) to minimize surface water infiltration. This will be the first priority in the implementation sequence.

TABLE A.1

INFILTRATION CONTROL PRIORITIES

	Estimated Contribution (% of total)[1]	
	TDS	**Water**
1. Salt Storage Area • Salt Pile • Salt Pile Run-Off Ditches	>90%	>35%
2. Salt Pile Evaporation Pond	<10%	>25%
3. Salt Storage Extension • Cells A & B • Salt Storage Extension Basin	100% (future)	<5%
4. Stormwater Controls		
• Evaporation Basin A	0	>25%
• Evaporation Basin B	0	<10%

[1]From DBSA, March 2003

Discontinued use of the current SP will require the development of new salt storage facilities. The new 15 acre± Salt Storage Extension (SSE) will include lined salt storage cells; and a double lined contact water evaporation basin (the SSE). The SSE will be constructed concurrent with the SP capping activities, and will control 100% of potential salt infiltration from future storage practices.

The remaining stormwater will be routed to lined evaporation basins that are designed to maintain zero discharge. Currently Basin A will be enlarged and lined with HDPE geomembrane. Currently Ponds 1 and 2 will be combined into a single lined unit Evaporation Basin B.

The infiltration controls consist of layered geosynthetic and soil systems designed to minimize infiltration. Because the SSE Basin will be the only unit that will continue to store and evaporate salt contact water, it is equipped with a double liner and leak detection system. The SSE cells have a floor drainage system designed to minimize fluid head (pressure) on the liner. The geosynthetic and soil liners and caps proposed in this design:

- Comply with applicable NMED regulations and guidelines.
- Consist of proven materials and conventional construction technologies.
- Have a demonstrated track record of performance in similar arid applications.
- Will, when completed, control nearly 100% of potential future salt infiltration; and over 95% of potential stormwater contributions.

Table A.2 provides a summary of the estimated sizes, capacities, and materials required for each infiltration control unit. The Conceptual Design Drawings (**Appendix A.2**) provides details on the dimensions and materials for the proposed installations.

TABLE A.2
Capacity/Materials Summary

Notes:
(1) Continued filling of SP to prepare minimum 2% slope (not included in total)
(2) Salt cut/fill necessary to prepare 3:1 sideslopes on SP

Area	Unit	Size (acres)	CAPACITY	Earth Moving (yd^3) [(s) = salt] [(a) = aggregate]			Geosynthetics (ft^2)		
				Cut	Fill	Cover	PE Liner	Geonet	Geotextile
1.0 Salt Storage Area	Salt Pile (SP)	18.8	120,000 tons[(1)]	36,000 (s)[(2)]	36,000 (s)[(2)]	55,000	840,000	--	840,000
	SP Pond (SPEP)	3.0	440,000 ft^3	Reshape	Reshape	--	150,000	--	--
	SP Ditches (SPRDs)	2.0	Design Storm	2,500	--	3,200(a)	88,000	--	--
SUBTOTAL		*23.8*	--	*2,500*	--	*55,000*	*1,078,000*	--	*840,000*
2.0 Salt Storage Extension	SW Berm	2.0	NA	18,000	54,000	--	--	--	--
	Cell A[(3)]	6.2	330,000 tons	18,000	20,000	20,000[(4)]	270,000	335,000	335,000
	SSE Basin	1.6	251,000 ft^3	18,000	--	--	150,000	75,000	1,000
	Cell B[(3)]	5.2	450,000 tons	--	30,000	17,000[(4)]	230,000	270,000	270,000
SUBTOTAL		*14.4*	--	*54,000*	*104,000*	*37,000*	*650,000*	*680,000*	*606,000*
3.0 Stormwater Controls	Evaporation Basin A[(5)]	7.3	1,000,000 ft^3	30,000	3,000	--	320,000	--	--
	Evaporation Basin B[(5)]	2.0	250,000 ft^3	5,000	5,000	--	88,000	--	--
SUBTOTAL		*9.3*	--	*35,000*	*8,000*	--	*408,000*	--	--
TOTALS		*47.5*	--	*91,500*	*112,000*	*55,000*	*2,086,000*	*655,000*	*1,446,000*

(3) Cells A & B include SP North Slope, geonet, and geotextile
(4) Protective Cover (2' thick) over new floor liner is salt or soil (not included in total)
(5) Estimated

2.0 SALT STORAGE AREA (SSA)

The Salt Storage Area (SSA) currently consists of approximately 35 acres that is a relatively independent drainage basin extending along the north perimeter of the WIPP site. The SSA consists of four primary drainage elements (see **Drawing 2**):

- The Salt Pile (SP) – 16.8 acres ±
- The Salt Pile Evaporation Pond (SPEP) – 3.5 acres ±
- The Salt Pile Run-off Ditches (SPRD's) – 1.5 acres ±
- Tributary areas (including some north parking lot run-off) – 13.2 acres ±

This design integrates discontinued use of the current SP in conjunction with development of a new lined salt storage unit (the Salt Storage Extension, **Section 3.0**). The other primary SSA systems (SPEP, SPRD's) will be lined with 60 mil HDPE geomembranes to prevent future infiltration of water.

Construction of the SSA infiltration control systems would involve the phased installations designed to address the most significant sources of salt and water first:

- Reshaping the SP with mined salt
- Capping the SP
- Installing Cell A of the new lined Salt Storage Extension
- Lining the new SSE Basin
- Lining the SPEP and associated ditches (east, south and northwest SPRD's)

2.1 Salt Pile (SP)

The first priority is to recontour the SP to prepare it for cap installation. A cut/fill approach is planned to reduce the sideslopes from about 1.5:1 to 3:1. This will extend the toe of the slope outward approximately 25'. The north sideslope of the SP will be regraded first to facilitate construction of the Salt Storage Extension.

Mined salt from ongoing operations will be used to shape the crown to a minimum 2% slope. This includes bringing the southwest lobe up to prevailing grade, and backfilling the ramp. In some limited circumstances, native soil may be used for reshaping the SP crown and sideslopes.

The SP cap system will be installed incrementally as the reshaping and base preparation is completed for individual segments. The cap configuration includes a 16 oz. geotextile cushion at the salt contact; with a 60 mil geomembrane above it. Textured HDPE will be used on the 3:1 sideslopes, and smooth 60 mil HDPE is planned for the crown. The geosynthetic layers will be anchored at the crest and toe of slope.

The north sideslope will be the first SP segment to be capped. The 60 mil textured HDPE geomembrane will also serve as the south sidewall liner for the Salt Storage Cells. This segment will include a geonet/geotextile layer that will serve both as a cushion for future salt placement; and as a drainage layer for water collection (see **Section 3.1**)

With the exception of the north sideslope, a min. 24″ thick protective soil layer will be placed over the entire SP cap. It is planned that this process will proceed incrementally following cap installation over individual segments. Vegetative cover, consisting of hardy native grasses, will be added and maintained.

2.2 Salt Pile Run-off Ditches (SPRD's)

New SPRD's will be installed along the east, south, and north part of the west perimeters. All north drainage will be directed to the SSE Basin, and the south part of the west slope drains directly to the SPEP. The ditches are designed to manage the 25-year, 24-hour storm event (see **Appendix A.1**).

The toe of the regraded SP will extend out about 25′ from its current position. A relatively horizontal bench about 20′ wide will be installed between the toe of the SP slope and the inside edge of the adjacent SPRD.

The SPRD's will be lined with 60 mil (smooth) HDPE geomembrane after base preparation to a design slope 0.5%. The ditches are designed to accommodate the standard geomembrane roll width (22' –23') so that seams will only be necessary every 400'±. The sideslope liner will be extended across the bench to tie in with the inside SPRD anchor. Because of the extension of the toe and addition of the bench, the prior ditch areas will be regraded and covered with the new liner system.

2.3 Salt Pile Evaporation Pond (SPEP)

After the SP is capped and the SPRD's are lined, the SPEP will receive clean stormwater only. The current footprint will be reshaped to accommodate the new watershed dimensions (e.g., eliminate north SP run-off; and the extension of the west SP footprint) (**Section 2.1**). The SPEP floor and sidewalls will be compacted with a "level" floor and 3:1 sideslopes. A single 60 mil (smooth) HDPE liner will be placed and anchored at the perimeters. Ballast or anchors will be deployed to resist uplift.

The SPEP is sized to detain and evaporate the design storm event (see **Appendix A.1**).

3.0 SALT STORAGE EXTENSION (SSE)

The Salt Storage Extension consists of two primary units:

- The Salt Storage Cells (A & B)
- The Salt Storage Extension Evaporation Basin

The Salt Storage Extension includes approximately 11.4 acres of lined salt storage capacity designed to receive up to 600,000 tons of mined salt (i.e., Panels 4– 8). The Salt Storage Extension is contiguous with the north slope of the SP, and is subdivided into Cell A and Cell B. The storage cells include a geomembrane liner; geonet cushion/drainage system; protective layer; and fluid collection piping. The collection system conveys any stormwater infiltrating through the stored salt by gravity to the Salt Storage Evaporation Basin. The SSE Basin will have a double liner with a leak detection system, and is sized to detain and evaporate the design storm. This is the only drainage element that will be receiving salt water contact run-off after the project is completed.

Installation of salt storage capacity is currently designed in two increments which are hydraulically connected. Cell A, which is west and downgradient, would be constructed first. Cell B involves extending the liner and water collection system upgradient (east) to the east limit of the SP. The boundary between Cells A & B can be selected based on incremental construction costs vs. capacity developed.

Construction of the Salt Storage Extension Cells and Evaporation Basin includes four primary components:

- Lining the north sideslope of the SP (see **Section 2.2**).
- Relocating the stormwater diversion berm.
- Earthmoving – including Basin excavation and Cell A base preparation.
- Installing liners and related systems in the Basin and Cell A.

Lining the north sideslope of the SP is discussed in **Section 2.1** This approach minimizes the footprint of the SSE by taking advantage of the "wedge" of airspace available between the SP and the new cells.

Simultaneous with sideslope preparation, the existing stormwater diversion berm must be relocated approximately 400′ north of its current position. An access zone approximately 50′ wide is provided at the east end of Cell B, where the berm will extend north approximately 400′ before it turns west. The new berm is approximately 8′ high with 3:1 sideslopes, and serves the same stormwater diversion purpose as the existing berm. The new berm will be a structural element for the Salt Storage Cell liner system, where the north edge of liner will be anchored. A construction berm approximately 8′ high is planned as the downgradient perimeter for Cell A. The berms will be constructed in horizontal lifts and subjected to conventional soil compaction and construction quality assurance standards (e.g., 90% Standard Proctor).

3.1 Cells A & B

Cell A includes a permanent berm along the west (downgradient) perimeter; and a temporary berm at the (upgradient) Cell B interface. Once at final design elevation, the soil in the floor and sidewalls of the Basin will be compacted. The fill soil placed as the foundation for Cell A will be placed in horizontal lifts and compacted.

The liner system for the new SSE Cells will be installed over the prepared subgrade in the floor area. On the north and east, it will be anchored at the top of the relocated stormwater diversion berm. On the south side, it will be anchored with the north SP sideslope cap to create a continuous impervious surface. On the west perimeter, the liner will be tied to the adjacent east sidewall liner of the SSE. The Cell A & Cell B liner configuration consists of the following layers, in ascending order:

- Compacted soil subbase (compacted sand on south slope)
- 60 mil (smooth) HDPE liner (textured on sideslopes)
- Collection system piping
- 200 mil geonet cushion/drainage layer
- 8 oz. geotextile filter fabric
- 2′ thick protective material layer (salt or soil)

Cells A & B are equipped with a continuous perforated pipe that slopes up at 1% from west to east to facilitate water collection off the liner to minimize head (i.e., water pressure). The pipe is enveloped in aggregrate, and daylights into the SSE Basin to allow gravity flow. A pipe boot is specified at the penetration of the west berm. Pipe cleanout capability is provided by a temporary riser at the upgradient terminus of Cell A; and a permanent cleanout riser at the east of Cell B.

3.2 SSE Basin

The new Salt Storage Extension Evaporation Basin has an estimated footprint of 1.6 acres with an average depth of 5′. The excavated soil (15,000 $yd^3 \pm$) will be used as fill and compacted to prepare Cell A to its design base grades.

Once the earthwork is complete, the prescribed liner systems will be installed in both the Basin and Cell A. Because the SSE Basin is the only unit that will manage salt water drainage in the future, it is equipped with a double liner system. The liner configuration, in ascending order, includes:

- Compacted soil subbase
- 60 mil (smooth) HDPE secondary liner
- 200 mil geonet leak detection layer
- 60 mil (smooth) HDPE primary liner

The leak detection layer will drain to a sump with an inclined riser to allow for future inspection and monitoring. Ballast or anchors will be deployed to resist uplift. No salt will be stored in the SSE until the Basin is complete.

4.0 STORMWATER CONTROLS

Future stormwater infiltration will be managed by lining the SPEP and Evaporation Basins A & B with 60 mil HDPE geomembranes. This will be the first priority in the implementation sequence. The watersheds for Basins A & B consist primarily of covered/paved surface and lined drainageways with culverts. Both basins will be sized to detain and evaporate the design storm event.

4.1 Evaporation Basin A

Basin A will be reshaped to accommodate the evaporation rate for the design storm; and to allow liner installation. Sidewalls will be prepared to maximum 3:1 sideslopes and compacted. The geomembrane liner system will be anchored at the perimeters, and uplift will be addressed with ballast or floor anchors.

4.2 Evaporation Basin B

Existing Ponds 1 & 2 may be combined into a single Evaporation Basin (Basin "B") designed to manage run-off from both watersheds. This unit will receive clean stormwater run-off only, and be lined consistent with the SPEP and Evaporation Basin A plans.

TABLE A.3
List of Acronyms

CTAC	Carlsbad Technical Assistance Contractor
DBSA	Daniel B. Stephens & Associates
DOE	Department of Energy
HDPE	High Density Polyethylene
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
SP	Salt Pile
SPEP	Salt Pile Evaporation Pond
SPRD	Salt Pile Run-off Ditches
SSA	Salt Storage Area
SSE	Salt Storage Extension
SSW	Shallow Subsurface Water
TDS	Total Dissolved Solids
WIPP	Waste Isolation Pilot Plant

APPENDIX A.1 – DRAINAGE CALCULATIONS

A.1.1 – 25-yr, 24-hr Storm Event

A.1.2 – Average Annual Climate Data

Appendix A.1.1 – 25-yr, 24-hr Storm Event

DESIGN BASIS
WIPP INFILTRATION CONTROLS – CONCEPTUAL DESIGN
SPEP and SSE BASIN CAPACITY ANALYSIS
25-YEAR, 24-HOUR PEAK STORM EVENT

Objective:

The objective of this calculation is to determine if the Salt Pile Evaporation Pond (SPEP) and the Salt Storage Evaporation (SSE) Basin have the capacity to contain the runoff from their respective watersheds due to a 25-Year, 24-Hour storm event.

Data:

1. Design Storm: 25-Year, 24-Hour Storm Event

   Reference: New Mexico State Highway and Transportation Department, Drainage Manual, Volume 1, Hydrology, 1995

   25-Year, 24-Hour Storm Event Depth = 3.90 inches

2. SSA Drainage Area

   Reference: WIPP Infiltration Controls Conceptual Design, Gordon Environmental, Inc., March 31, 2003 [Drawing 12]

   Drainage Area ~ 27.5 acres

3. SSE Basin Drainage Area

   Reference: WIPP Infiltration Controls Conceptual Design, Gordon Environmental, Inc., March 31, 2003 [Drawing 12]

   Drainage Area ~ 10.4 acres

4. SPEP Capacity:

   Length of Pond: 425 feet (+/-)
   Width of Pond: 360 feet (+/-)
   Total Depth of Pond = 4 feet (+/-)
   Freeboard = 1 foot

   Pond Capacity = Calculated using Prismoid Equation Excel Worksheet (see **Attachment 1**).

   Pond Capacity = 438,000 ft^3

5. SSE Basin Capacity:

   Length of Basin: 265 feet (+/-)
   Width of Basin: 260 feet (+/-)
   Total Depth of Basin = 5 feet (+/-)
   Freeboard = 1 foot

Basin Capacity ~ Calculated using Prismoid Equation Excel Worksheet (see **Attachment 2**).

Basin Capacity ~251,000 ft^3

Calculation

1. SSA Drainage Basin Runoff Volume

   Assume 100% Runoff (i.e., 0 inches of infiltration) for the entire 27.5 acre basin.

   Volume of Runoff = [27.5 acres] x [43,560 sf/acre] x [3.90 in/12 in/ft] ~ **390,000 ft^3**

2. SSE Drainage Basin Runoff Volume

   Assume 100% Runoff (i.e., 0 inches of infiltration) for the entire 10.4 acre basin.

   Volume of Runoff = [10.4 acres] x [43,560 sf/acre] x [3.90 in/12 in/ft] ~ **147,500 ft^3**

Results

1. The SPEP has more than adequate capacity to store the 25-year, 24-hour storm event runoff without using the available freeboard.

2. The SSE Basin has more than adequate capacity to store the 25-year, 24-hour storm event runoff without using the available freeboard.

ATTACHMENT 1
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SPEP Area/Volume Calculation

Width at grade (ft)	360		**Footprint area (acres)**	**=**	**3.5**
Length at grade (ft)	425				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	3		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	**=**	**342.0**	**Width of top (ft)**	**=**	**0.0**
Length of base (ft)	**=**	**407.0**	**Length of top (ft)**	**=**	**0.0**
Volume of prismoid below grade (cf) =		**438,129**	**Volume of prismoid above grade (cf) =**		**-**
Volume of prismoid below grade (cy) =		**16,227**	**Volume of prismoid above grade (cy) =**		**-**
Area of "liner" below grade (sf)		**153,747**			
Area of "cap" above grade (sf)		**153,000**			
Total airspace volume (cf) =		**438,129**			
Total airspace volume (cy) =		**16,227**			

ATTACHMENT 2
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SSE Basin Area/Volume Calculation

Width at grade (ft)	260		**Footprint area (acres)**	=	1.6
Length at grade (ft)	265				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	4		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	=	236.0	**Width of top (ft)**	=	0.0
Length of base (ft)	=	241.0	**Length of top (ft)**	=	0.0
Volume of prismoid below grade (cf) =		251,168	**Volume of prismoid above grade (cf) =**		-
Volume of prismoid below grade (cy) =		9,303	**Volume of prismoid above grade (cy) =**		-
Area of "liner" below grade (sf)		69,550			
Area of "cap" above grade (sf)		68,900			
Total airspace volume (cf) =		**251,168**			
Total airspace volume (cy) =		**9,303**			

Appendix A.1.2 – Average Annual Climate Data

WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
EVAPORATION BASIN POTENTIAL
PERFORMANCE BASED ON AVERAGE ANNUAL CLIMATIC DATA

OBJECTIVE:

The purpose of this study was to determine the evaporation potential for the Salt Pile Evaporation Pond (SPEP) and Salt Storage Extension (SSE) Basin to determine if the capacity is adequate to manage the anticipated runoff from the SPEP watershed based on average monthly precipitation and evaporation data.

1.0 CLIMATIC DATA

WIPP is located in southeast New Mexico near Carlsbad, New Mexico. WIPP averages 15 inches of normal precipitation annually (Reference: Western Region Climatic Center, (www.wrcc.dri.edu) 1961-1990 Monthly Climate Summary, Waste Isolation Pilot Plant, New Mexico (299569)) and the dry climate provides a high pan evaporation rate, averaging in excess of 90-inches per year (Reference: Western Region Climatic Center, (www.wrcc.dri.edu) Evaporation Table for the Western United States, Monthly Average Pan Evaporation, Lake Avalon, New Mexico)). Given these two climatic conditions, evaporation is proven to be an effective means for reduction in runoff volumes after collection by the pond. The mean temperature, average rainfall and average evaporation rates by month are provided in **Table A.1.2-1**

TABLE A.1.2-1

AVERAGE MONTHLY TEMPERATURE, PRECIPITATION AND EVAPORATION DEPTHS FOR THE WASTE ISOLATION PILOT PLANT AND VICINITY

Month	Mean Temperature[1] (° F)	Average Precipitation (inches)	Average Evaporation (inches)
January	45.0	0.38	0.0
February	49.7	0.39	0.0
March	55.4	0.29	0.0
April	64.5	0.62	12.36
May	74.1	1.41	14.31
June	81.6	1.95	15.16
July	83.6	2.22	14.14
August	81.6	1.85	12.33
September	75.2	1.85	9.25
October	65.4	0.76	7.26
November	52.5	0.33	0.0
December	44.9	0.85	0.0
Average Annual		**12.90**	**84.81**

Note: 1. Evaporation potential (inches) is assumed to occur above a base temperature ~ 65°F.

2.0 SPEP EVAPORATION POTENTIAL

The dimensions of the SPEP were determined from the WIPP Infiltration Controls Conceptual Design Drawings and are:

- Top of Pond Length = 425 feet (+/-)
- Top of Pond Width = 360 feet (+/-)
- Depth = 4 feet (+/-)
- Sideslopes = 3H:1V

This configuration provides approximately 154,000 ft^2 (See **Attachment 1)** of area for evaporation assuming the pond is allowed a maximum 3-foot of water with a 1-foot freeboard. **Table A.1.2-2** presents the mass balance for the SPEP and assumes the installation and vegetation of the planned 2-foot soil cap over the entire salt pile (18.8 Acres).

The results in **Tale A.1.2-2** indicate that the evaporation pond system will reach a steady state mass balance at the end of the 2nd year of operation from which the same amount of collected stormwater (94,235 ft^3) remains in December of each operating year. This mass balance is based on average monthly values for precipitation and evaporation and will vary depending on wet as well as dryer years.

3.0 SSE BASIN EVAPORATION POTENTIAL

The dimensions of the SSE Basin were determined from the WIPP Infiltration Controls Conceptual Design Drawings and are:

- Top of Pond Length = 265 feet (+/-)
- Top of Pond Width = 260 feet (+/-)
- Depth = 5 feet (+/-)
- Sideslopes = 3H:1V

This configuration provides approximately 70,000 ft^2 (See **Attachment 2)** of area for evaporation assuming the pond is allowed a maximum 4-foot of water with a 1-foot freeboard. **Table A.1.2-3** presents the mass balance for the SSE Basin and assumes 100% runoff of precipitation over the SSE 10.4 (+/-) acreage.

The results in **Table A.1.2-3** indicate that the evaporation pond system will reach a steady state mass balance at the end of the 2^{nd} year of operation from which the same amount of collected stormwater ($47,626\ ft^3$) remains in December of each operating year. This mass balance is based on average monthly values for precipitation and evaporation and will vary depending on wet as well as dryer years.

ATTACHMENT 1
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SPEP Area/Volume Calculation

Width at grade (ft)	360		**Footprint area (acres)**	=	3.5
Length at grade (ft)	425				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	3		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	=	342.0	**Width of top (ft)**	=	0.0
Length of base (ft)	=	407.0	**Length of top (ft)**	=	0.0
Volume of prismoid below grade (cf) =		438,129	**Volume of prismoid above grade (cf) =**		-
Volume of prismoid below grade (cy) =		16,227	**Volume of prismoid above grade (cy) =**		-
Area of "liner" below grade (sf)		153,747			
Area of "cap" above grade (sf)		153,000			
Total airspace volume (cf) =		**438,129**			
Total airspace volume (cy) =		**16,227**			

ATTACHMENT 2
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SSE Basin Area/Volume Calculation

Width at grade (ft)	260		Footprint area (acres)	=	1.6
Length at grade (ft)	265				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	4		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	=	**236.0**	**Width of top (ft)**	=	**0.0**
Length of base (ft)	=	**241.0**	**Length of top (ft)**	=	**0.0**
Volume of prismoid below grade (cf) =		**251,168**	**Volume of prismoid above grade (cf) =**		**-**
Volume of prismoid below grade (cy) =		**9,303**	**Volume of prismoid above grade (cy) =**		**-**
Area of "liner" below grade (sf)		**69,550**			
Area of "cap" above grade (sf)		**68,900**			
Total airspace volume (cf) =		**251,168**			
Total airspace volume (cy) =		**9,303**			

TABLE A.1.2-2

WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SP EVAPORATION POND MASS BALANCE

Month	Average Monthly Temperature (°F)[1]	Average Monthly Precipitation (in)[2]	Runoff Volume (ft^3)[3]	Average Monthly Evaporation (in)[4]	Average Evaporation Potential (ft^3)[5]	First Year Net Monthly Mass Balance (ft^3)[6]	Second Year Net Monthly Mass Balance (ft^3)[6]	Third Year Net Monthly Mass Balance (ft^3)[6]
January	45.0	0.38	30,347	0	0	30,347	124,582	124,582
February	49.7	0.39	31,145	0	0	61,492	155,727	155,727
March	55.4	0.29	23,159	0	0	84,652	178,886	178,886
April	64.5	0.62	49,513	12.36	158,359	0	70,040	70,040
May	74.1	1.41	112,603	14.31	183,343	0	0	0
June	81.6	1.95	155,727	15.16	194,234	0	0	0
July	83.6	2.22	177,289	14.14	181,165	0	0	0
August	81.6	1.85	147,741	12.33	157,975	0	0	0
September	75.2	1.85	147,741	9.25	118,513	29,228	29,228	29,228
October	65.4	0.76	60,694	7.26	93,017	0	0	0
November	52.5	0.33	26,354	0	0	26,354	26,354	26,354
December	44.9	0.85	67,881	0	0	94,235	94,235	94,235
Total		**12.90**	**1,030,194**	**84.81**	**1,086,607**			

Notes:

1. Evaporation Potential (inches) is assumed to occur above an average monthly temperature base of ~ 65°F.
2. 1986 - 2000 Monthly Climatic Data Summary, Waste Isolation Pilot Plant, New Mexico (299569), Western Region Climatic Center.
3. (27.5 acres) x (43,560 sf/acre) x (Avg. Monthly Precipitation / 12)
4. Western Region Climatic Center, Average Monthly Pan Evaporation Rates, Lake Avalon, New Mexico.
5. (153,747 sf) x (Avg. Monthly Evaporation) [See Attachment 1].
6. [Runoff Volume - Average Evaporation Potential + Previous Months Net Balance]; also assumes pond is empty at the beginning of the first year.

TABLE A.1.2-3

WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SSE BASIN MASS BALANCE

Month	Average Monthly Temperature (^{O}F)[1]	Average Monthly Precipitation (in)[2]	Runoff Volume (ft^3)[3]	Average Monthly Evaporation (in)[4]	Average Evaporation Potential (ft^3)[5]	First Year Net Monthly Mass Balance (ft^3)[6]	Second Year Net Monthly Mass Balance (ft^3)[6]	Third Year Net Monthly Mass Balance (ft^3)[6]
January	45.0	0.38	14,346	0	0	14,346	61,972	61,972
February	49.7	0.39	14,723	0	0	29,069	76,695	76,695
March	55.4	0.29	10,948	0	0	40,017	87,643	87,643
April	64.5	0.62	23,406	12.36	71,637	0	39,413	39,413
May	74.1	1.41	53,230	14.31	82,938	0	9,705	9,705
June	81.6	1.95	73,616	15.16	87,865	0	0	0
July	83.6	2.22	83,809	14.14	81,953	1,856	1,856	1,856
August	81.6	1.85	69,841	12.33	71,463	235	235	235
September	75.2	1.85	69,841	9.25	53,611	16,465	16,465	16,465
October	65.4	0.76	28,692	7.26	42,078	3,078	3,078	3,078
November	52.5	0.33	12,458	0	0	15,537	15,537	15,537
December	44.9	0.85	32,089	0	0	47,626	47,626	47,626
Total		**12.90**	**487,001**	**84.81**	**491,545**			

Notes:
1. Evaporation Potential (inches) is assumed to occur above an average monthly temperature base of ~ 65^{O}F.
2. 1986 - 2000 Monthly Climatic Data Summary, Waste Isolation Pilot Plant, New Mexico (299569), Western Region Climatic Center.
3. (10.5 acres) x (43,560 sf/acre) x (Avg. Monthly Precipitation / 12).
4. Western Region Climatic Center, Average Monthly Pan Evaporation Rates, Lake Avalon, New Mexico.
5. (69,550 sf) x (Avg. Monthly Evaporation) [See Attachment 2].
6. [Runoff Volume - Average Evaporation Potential + Previous Months Net Balance]; also assumes pond is empty at the beginning of the first year.

ATTACHMENT B

Excerpts from WIPP 2002 NOI Attachment 4, <u>"Exhaust Shaft: Phase 2 Hydraulic Assessment Data Report Involving Drilling, Installation, Water-Quality Sampling, and Testing of Piezometers 1 – 12"</u>, 1997 surface water TDS measurements from Salt Pile Evaporation Pond and Salt Pile Run-off Ditches.

Notice of Intent

Waste Isolation Pilot Plant
Carlsbad, New Mexico

October 30, 2002

having a slope of 10 percent extends into and divides the pile into two sections (east and west) that are approximately equal in area. Mine safety regulations require that a small berm (about 3 to 4 feet in height) be maintained at the top of the SP to prevent trucks from backing over the edge of the pile during unloading, and there are about 13 acres within the berm.

The SPEP receives run-off from a watershed that includes areas in addition to those in the original design calculations (349,920 cubic feet design requirement, see April 1983 NOI in Attachment 1). The run-off entering the SPEP consists of storm water from portions of the plant site and parking lot and run-off generated from the SP side slopes (approximately 4 acres of surface area) and access ramp. Also, a portion of the plant site run-off is diverted from the south through culverts that feed into the SPEP rather than being directed off-site. The 13 acres within the SP berm do not normally drain to the evaporation pond, and most precipitation either infiltrates or evaporates from the SP surface.

The SPEP capacity is approximately twice the design volume because the actual berm height is 7 feet compared to 3 feet in the original design. Ditches designed to divert storm water from a small area north of the SPEP are not operating at full capacity. There is also minor side slope erosion on the SP and within the run-off ditches, and some accumulation of sediment in the SPEP. However, the erosion, accumulation of sediment, and additional run-off into the SPEP are offset by the over-sized capacity of the SPEP.

Infiltration of water into the SP and SPEP will vary, depending on the intensity of rain and the condition of the ground surface. Actual infiltration on the SP surface depends on rainfall intensity and duration, the age of the salt, the condition of the surface as a result of prior rains, and atmospheric conditions. Field observations indicate that a portion of direct rainfall will penetrate the SP surface, and that subsequent evaporation will be minimal.

Storm water samples collected from the SPEP and SP run-off ditches (these ditches have also been referred to as the SP "moat") in 1997 showed total dissolved solids (TDS) concentrations of 2,630 mg/L and 9,320 mg/L, respectively (see report at Attachment 4).

4.0 Shallow Hydrogeology at the WIPP Site

4.1 Introduction

Shallow subsurface water occurs beneath the WIPP site at a depth of less than 100 feet below ground surface (bgs) at the contact between the lower Santa Rosa Formation and the upper Dewey Lake Formation. This SSW yields generally less than 1 gallon per minute in monitoring wells and piezometers and contains high concentrations of TDS and chlorides. The origin of this water is believed to be primarily from anthropogenic causes, with some contribution from natural sources. The SSW occurs not only under the WIPP site surface facilities but also to the south as indicated by the recent encounter in drillhole C-2737 about a half mile south of the Waste Shaft (Powers, 2002a, see Attachment 8). Figure 1 is a map of the WIPP site showing the location of this drillhole (which was completed as Well C-2737).

Well C-2737 monitors units of the deeper Rustler Formation, and was drilled to replace monitoring Well H-1, which has been plugged and abandoned. Well H-1 monitored water levels within the Culebra and Magenta Dolomite Members of the Rustler Formation. Well H-1, originally drilled and completed in 1978, was replaced because its steel casing was deteriorating and the water level data it was providing on the Magenta Member were suspect. During the

This document was included as Attachment 4 to 10/30/02 NOI

DOE-WIPP 97-2278

EXHAUST SHAFT: PHASE 2 HYDRAULIC ASSESSMENT DATA REPORT INVOLVING DRILLING, INSTALLATION, WATER-QUALITY SAMPLING, AND TESTING OF PIEZOMETERS 1-12

DECEMBER 1997

Waste Isolation Pilot Plant
Carlsbad, New Mexico

Processing and final preparation of this report was performed by the Waste Isolation Pilot Plant Management and Operating Contractor for the U.S. Department of Energy under contract No. DE-AC04-86AL31950

APPENDIX 2

Composition and Origin of Groundwater at the Santa Rosa/Dewey Lake Contact

2.0 Analytical Results for Groundwater and Surface-Water Samples

Appendix A contains analytical results for monitoring-well samples collected from September 1996 through October 1997 and piezometer-well samples collected from July 1997 through October 1997. However, analytical results on monitoring-well samples collected in September of 1996 are not used in the geochemical analysis presented in Section 3.0 because these samples were collected during well development and contained abundant sediment. Therefore, six rounds of data are available for the 3 monitoring wells and three rounds of data are available for 11 of the 12 piezometer wells. Piezometer well PZ-08 is dry and was not sampled. Abundant sediment in PZ-01 shut down the pump and a sample could not be collected during the first-round event. PZ-01 was developed further and a water sample was obtained during the second- and third-round event. The cation and anion charge balance of the samples is good (i.e., within ± 5 %) with the exception of five samples. An assessment of data quality is provided in Appendix A.

A single round of surface-water samples was collected on July 31 and August 1, 1997 after a large thunderstorm event. Surface-water samples were collected from seven locations: a drainage ditch west of the Support Building, Retention Basins A, B, and C, the moat around the salt pile, the salt pile evaporation pond, and the SE corner of the site within the fenced area (Figure 1). The highest TDS values were measured in samples from the salt pile evaporation pond and moat (2,630 to 9,320 mg/L; Appendix A), and the lowest TDS values were recorded for water collected from the retention basins (100 to 165 mg/L; Appendix A). Surface waters collected from the retention basin have excess positive charge balance (i.e., greater than 5 %). Additional details on data quality are provided in Appendix A.

Table A-1 in Appendix A provides a summary of simple statistics for all parameters analyzed. Simple statistics were calculated using reported detection limit values, unless the reported detection limit was greater than reported analyte concentrations. For example, February 1997 results for boron at monitoring well C2505 were reported as less than 1 milligram per liter (mg/L) but in May 1997 were reported as 0.27 mg/L (Table A-1,

TABLE A-1
Analytical Results from WASTREN Laboratory, Grand Junction, Colorado
And Calculation of Simple Statistics

Sample ID	Date	Location	SG	TDS	Cl	SO4	Br	NO3	NH4	TIC	TOC	Na
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Groundwater Samples												
WST97250/251/252	7/21/97	PZ-12	1.0	4060	1540	404	3.6 B	21.0	0.0070 U	56.9	1.9	386
WST97253/254/255	7/21/97	PZ-12	1.0	3860	1550	404	3.7 B	21.0	0.0070 U	55.4	2.1	388
WST97396/397/398	9/10/97	PZ-12	1.0	3290	1430	448	3.2	14.9	0.0335	61.4	5.7	436
WST97487	10/16/97	PZ-12	1.0	3400	1420	483	4.4	13.9	0.0070 U	53.5	6.4	410
WST97488/489/490	10/16/97	PZ-12	1.0	3440	1420	481	4.3	13.8	0.0070 U	58.4	8.4	408
Number of Samples			5	5	5	5	5	5	5	5	5	5
MEAN			1.0	3810	1472	444	3.8	16.9	0.012	57.1	4.9	406
Standard Deviation			0.0	332	67	39	0.5	0.1	0.012	3.0	2.8	20
minimum			1.0	3290	1420	404	3.2	13.8	0.0070	53.5	1.9	386
maximum			1.0	4060	1550	483	4.4	21.0	0.0335	61.4	8.4	436
Surface-Water Samples												
WST97274/275/276	7/31/97	DD	1.0	400	15.7	11.9	0.1 U	0.23 B	0.323	17.2	35.8	11.2
WST97278/279/280	7/31/97	DD	1.0	360	15.6	11.9	0.1 U	0.22 B	0.316	16.9	35.1	11.0
WST97282/283/284	8/1/97	SPEP	1.0	2760	1490	79.9	0.4 U	0.43 B	0.0276	15.7	6.9	952
WST97286/287/288	8/1/97	SPEP	1.0	2630	1480	79.9	0.4 U	0.42 B	0.0253	16.4	7.7	950
WST97290/291/292	8/1/97	SPM	1.0	9320	4990	524	1.0 U	1.9	0.123	5.9	3.1	3200
WST97293/294/295	8/1/97	RB-A	1.0	100	4.1	4.0	0.1 U	0.16 B	0.0253	13.0	8.4	4.6 B
WST97296/297/298	8/1/97	RB-A	1.0	143	10.7	10.3	0.1 U	2.6	0.0741	15.4	4.9	8.3
WST97300/301/302	8/1/97	RB-B	1.0	123	10.9	10.4	0.1 U	2.6	0.0718	16.0	4.6	8.2
WST97304/305/306	8/1/97	RB-C	1.0	165	12.1	7.0	0.1 U	2.1	0.0950	19.5	4.8	18.9
WST97308/309/310	8/1/97	SE corner	1.0	180	49.7	18.8	0.1 U	1.4	0.0253	9.6	2.5	30.9

ATTACHMENT C

Water Level Measurements for January 2003

Waterlevel Measurements
For
January 2003

WELL NUMBER	ZONE	CASING ELEVATION ft amsl	DATE	TIME (MST)	DEPTH TO WATER ft	ADJUST TO TOC ft	ADJUSTED DEPTH TOC ft	ADJUSTED DEPTH METERS	WATER LEVEL ELEVATION ft amsl	ELEVATION IN METERS amsl	ADJUSTED FRESHWATER HEAD ft amsl
AEC-7	CUL	3657.25	01/21/03	07:20	620.19	0.98	619.21	188.74	3038.04	925.99	3060.97
C-2737 (PIP)	CUL	3399.30	01/22/03	11:12	383.03	0.75	382.28	116.52	3017.02	919.59	3017.02
CB-1	CUL	3328.38	01/21/03	13:05	347.61	0.93	346.68	105.67	2981.70	908.82	2985.56
DOE-1	CUL	3466.04	01/21/03	13:24	487.57	0.00	487.57	148.61	2978.47	907.84	3007.10
ERDA-9	CUL	3410.10	01/22/03	11:00	400.89	0.65	400.24	121.99	3009.86	917.41	3025.37
H-02b2	CUL	3378.31	01/23/03	08:46	339.50	0.00	339.50	103.48	3038.81	926.23	3041.17
H-03b2	CUL	3390.03	01/21/03	13:42	389.61	0.00	389.61	118.75	3000.42	914.53	3011.82
H-04b	CUL	3333.35	01/21/03	14:27	331.59	0.00	331.59	101.07	3001.76	914.94	3005.36
H-05b	CUL	3506.04	01/21/03	08:10	477.08	0.00	477.08	145.41	3028.96	923.23	3073.90
H-06b	CUL	3348.25	01/22/03	08:00	294.00	0.00	294.00	89.61	3054.25	930.94	3068.49
H-07b2	CUL	3165.07	01/20/03	09:40	167.66	0.00	167.66	51.10	2997.41	913.61	2997.32
H-10c	CUL	3688.64	01/20/03	11:45	663.04	0.00	663.04	202.09	3025.60	922.20	3025.60
H-11b4	CUL	3410.89	01/21/03	12:15	426.40	0.00	426.40	129.97	2984.49	909.67	3004.58
H-12	CUL	3427.19	01/20/03	12:25	456.40	0.00	456.40	139.11	2970.79	905.50	3008.16
H-17	CUL	3385.31	01/21/03	12:30	422.05	0.00	422.05	128.64	2963.26	903.20	3012.70
H-19b0	CUL	3418.38	01/23/03	09:09	427.44	0.00	427.44	130.28	2990.94	911.64	3012.79
P-17	CUL	3337.24	01/21/03	12:45	353.25	0.54	352.71	107.51	2984.53	909.68	2998.78
WIPP-12	CUL	3472.06	01/22/03	10:30	438.66	0.00	438.66	133.70	3033.40	924.58	3070.32
WIPP-13	CUL	3405.71	01/22/03	09:44	347.72	0.00	347.72	105.99	3057.99	932.08	3068.58
WIPP-19	CUL	3435.14	01/22/03	10:37	393.92	0.00	393.92	120.07	3041.22	926.96	3079.15
WIPP-21	CUL	3418.96	01/22/03	10:52	401.58	0.00	401.58	122.40	3017.38	919.70	3041.62
WIPP-22	CUL	3428.12	01/22/03	10:44	396.60	0.00	396.60	120.88	3031.52	924.01	3062.71
WIPP-25 (PIP)	CUL	3214.39	01/20/03	08:12	152.46	0.42	152.04	46.34	3062.35	933.40	3059.26
WIPP-26	CUL	3153.20	01/20/03	08:42	130.21	0.00	130.21	39.69	3022.99	921.41	3023.13
WIPP-27 (PIP)	CUL	3178.98	01/20/03	07:24	96.51	0.42	96.09	29.29	3082.89	939.66	3089.00
WIPP-29	CUL	2978.26	01/20/03	09:09	11.17	0.00	11.17	3.40	2967.09	904.37	2970.26
WIPP-30 (PIP)	CUL	3429.05	01/22/03	07:02	359.12	0.70	358.42	109.25	3070.63	935.93	3077.78
WQSP-1	CUL	3419.20	01/22/03	08:16	364.05	0.16	363.89	110.91	3055.31	931.26	3072.07
WQSP-2	CUL	3463.90	01/22/03	10:00	402.87	0.16	402.71	122.75	3061.19	933.05	3081.01
WQSP-3	CUL	3480.30	01/22/03	10:18	467.41	0.16	467.25	142.42	3013.05	918.38	3070.36
WQSP-4	CUL	3433.00	01/23/03	09:00	444.80	0.16	444.64	135.53	2988.36	910.85	3013.38
WQSP-5	CUL	3384.40	01/23/03	09:17	380.57	0.16	380.41	115.95	3003.99	915.62	3011.07
WQSP-6	CUL	3363.80	01/23/03	09:25	346.88	0.16	346.72	105.68	3017.08	919.61	3020.83
C-2737 (ANNULUS)	MAG	3399.30	01/22/03	11:18	258.00	0.00	258.00	78.64	3141.30	957.47	
H-02b1	MAG	3378.46	01/23/03	08:40	231.96	0.00	231.96	70.70	3146.50	959.05	
H-03b1	MAG	3390.64	01/21/03	13:37	260.48	0.00	260.48	79.39	3130.16	954.07	
H-04c	MAG	3334.04	01/21/03	14:14	191.19	0.00	191.19	58.27	3142.85	957.94	
H-05c	MAG	3506.04	01/21/03	08:18	349.12	0.00	349.12	106.41	3156.92	962.23	
H-06c	MAG	3348.52	01/22/03	07:49	282.99	0.00	282.99	86.26	3065.53	934.37	
H-08a	MAG	3432.99	01/20/03	10:38	406.02	0.00	406.02	123.75	3026.97	922.62	
H-10a	MAG	3688.67	01/20/03	11:53	468.53	0.00	468.53	142.81	3220.14	981.50	
WIPP-25 (ANNULUS)	MAG	3214.39	01/24/03	13:00	162.40	0.00	162.40	49.50	3051.99	930.25	
H-03d/DL (PVC)	DL	3390.01	01/21/03	13:52	317.12	2.22	314.90	95.98	3075.11	937.29	
WQSP-6a	DL	3364.70	01/23/03	09:32	167.11	0.25	166.86	50.86	3197.84	974.70	
H-08c	RUS/SAL	3432.90	01/20/03	10:45	453.00	0.00	453.00	138.07	2979.90	908.27	
AEC-8	B/C	3537.10	01/21/03	07:50	472.69	0.00	472.69	144.08	3064.41	934.03	
CB-1 (PIP)	B/C	3328.38	01/21/03	13:00	314.80	1.03	313.77	95.64	3014.61	918.85	
C-2505	SR/D	3413.05	01/23/03	11:03	45.61	0.00	45.61	13.90	3367.44	1026.40	
C-2506	SR/D	3412.87	01/23/03	11:07	45.02	0.00	45.02	13.72	3367.85	1026.52	
C-2507	SR/D	3410.01	01/23/03	11:00	45.66	0.00	45.66	13.92	3364.35	1025.45	
C-2811	SR/D	3398.92	01/22/03	11:25	60.59	0.00	60.59	18.47	3338.33	1017.52	
PZ-01	SR/D	3413.41	01/23/03	11:14	42.62	0.00	42.62	12.99	3370.79	1027.42	
PZ-02	SR/D	3413.42	01/23/03	11:11	44.00	0.00	44.00	13.41	3369.42	1027.00	
PZ-03	SR/D	3416.15	01/23/03	11:24	45.59	0.00	45.59	13.90	3370.56	1027.35	
PZ-04	SR/D	3412.10	01/23/03	11:18	47.70	0.00	47.70	14.54	3364.40	1025.47	
PZ-05	SR/D	3415.31	01/23/03	11:26	43.30	0.00	43.30	13.20	3372.01	1027.79	
PZ-06	SR/D	3413.49	01/23/03	11:35	43.71	0.00	43.71	13.32	3369.78	1027.11	
PZ-07	SR/D	3413.99	01/23/03	10:34	37.82	0.00	37.82	11.53	3376.17	1029.06	
PZ-09	SR/D	3421.21	01/23/03	10:26	57.56	0.00	57.56	17.54	3363.65	1025.24	
PZ-10	SR/D	3405.80	01/23/03	09:53	38.08	0.00	38.08	11.61	3367.72	1026.48	
PZ-11	SR/D	3418.95	01/23/03	10:40	45.74	0.00	45.74	13.94	3373.21	1028.15	
PZ-12	SR/D	3408.99	01/23/03	10:04	53.51	0.00	53.51	16.31	3355.48	1022.75	
H-09c	MAG	3407.30	01/20/03	11:07	273.21	0.00	273.21	83.27	3134.09	955.27	

* Density data not acquired, therefore adjusted freshwater head measurements cannot be calculated for these wells.

ATTACHMENT D

Excerpt from WIPP 2002 NOI, Table 1, Analytical Results for Shallow Subsurface Water, December 2001

Table 1. Analytical results for Shallow Subsurface Water, December 2001

Parameter	Units	C-2505	C-2506	C-2507	Dup.	C-2811	PZ-1
Ammonium	mg/L	0.097	0.0967	<0.0042	0.0075	<0.0042	0.0699
Arsenic	mg/L	<0.003	<0.003	0.0015	0.0017	0.0014	<0.003
Barium	mg/L	0.103	0.0914	0.0377	0.0386	0.0934	0.125
Boron	mg/L	0.17	0.12	0.27	0.25	0.17	0.079
Bromide	mg/L	9.9	9.5	5.3	5.6	2.8	19.2
Cadmium	mg/L	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.001
Calcium	mg/L	943	1250	418	431	283	4250
Chloride	mg/L	6230	9240	1300	1330	956	33100
Chromium	mg/L	0.0141	0.0099	0.0491	0.0535	0.0017	0.0108
Iron	mg/L	<0.008	<0.008	<0.0008	<0.0008	<0.0008	<0.008
Lead	mg/L	0.0048	<0.001	0.00012	<0.0001	<0.0001	<0.001
Magnesium	mg/L	646	820	337	331	207	2310
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0016
Nitrate	mg/L	23.2	23.2	26	25.7	27.9	4.9
Nitrite	mg/L	0.0165	<0.0082	0.0139	0.0156	0.0147	<0.0082
pH		7.28	7.2	7.61	7.42	7.56	6.94
Potassium	mg/L	11.3	14.5	6.5	6.5	4.6	32
Selenium	mg/L	0.112	0.0447	0.075	0.0698	0.0243	0.0753
Silicon	mg/L	22.7	22.3	25	25	22.3	19.4
Silver	mg/L	<0.001	<0.001	<0.0001	0.00012	<0.0001	<0.001
Sodium	mg/L	2030	3230	328	329	163	12700
Specific Gravity	mg/g	1.01	1.01	1	1	1	1.04
Sulfate	mg/L	1290	1300	940	970	379	1610
Total Dissolved Solids	mg/L	13000	18000	4170	4180	2630	62200
Total Inorganic Carbon	mg/L			75.1	75.8	49.5	
Total Organic Carbon	mg/L			3	2.9	1.4	
Total Suspended Solids	mg/L	<20	<20	<20	<20	<20	<20
Zinc	mg/L	<0.05	<0.05	0.0438	0.0386	0.0357	<0.05

ATTACHMENT E

The December 31, 2002 letter from C. Marshall of the GWQB to I. Triay of WIPP, requested the following items:

1. "*NMED recommends that a subsurface geologic map be constructed at the unconformity that extends from the top of the Santa Rosa Formation along the base of the Gatuna Formation. This map should aid in understanding the relationship between the SSW and the extent of the Santa Rosa Formation*".

   A map showing the elevation of the erosional base of the Gatuna Formation is attached to this DP Application (Figure E1).

2. *An isopach map of the Santa Rosa Formation may also be helpful*".

   An isopach map of the Santa Rosa Formation is attached to this DP Application (Figure E2).

3. "*Please provide an updated potentiometric map reflecting the most recent water level measurements for the SSW*".

   A potentiometric surface map depicting recent water level data is attached to this DP Application (Figure E3).

4. "*...a more detailed analysis and discussion, as well as an updated TDS isoconcentration map would be helpful in explaining the high TDS concentrations in and around PZ-9 and PZ-3*".

   An updated TDS isoconcentration map is attached to this application (Figure E4). The analytical results used to generate this map were from samples obtained during December 2002. The current hydrologic conceptual model for the anthropogenic subsurface water (SSWa) was developed based on the potentiometric surface map.

   Focused recharge to the SSWa has occurred through the salt pile (SP) and salt pile evaporation pond (SPEP). Recharge has occurred through precipitation and through historical discharges (WIPP NOI 2002) in the vicinity of the SPEP and SP, creating a mound of water where vertical movement is impeded by cementation changes at the Santa Rosa Formation and Dewey Lake Redbeds Formation contact. Flow from this area is believed to be multidirectional.

   TDS concentrations generally decrease in a radial direction from the SPEP and SP. Piezometer PZ-9 is close to the SP and the TDS concentration is high in this well and compared to the other locations. Additionally, it appears that wells located predominantly down gradient, but immediately adjacent to focused "clean" recharge sources, are being diluted more than others away from such focused recharge points. For example, PZ-10 is near the storm water detention basin and exhibits a low TDS concentration. TDS concentrations for PZ-3 during this latest round of sampling indicated a significant decrease when compared to previous sampling rounds, but remains among the greatest TDS, along with wells nearest the SP (PZ-7, PZ-5, PZ-6). This follows the trend of decreased TDS as a function of distance from the SP/SPEP.

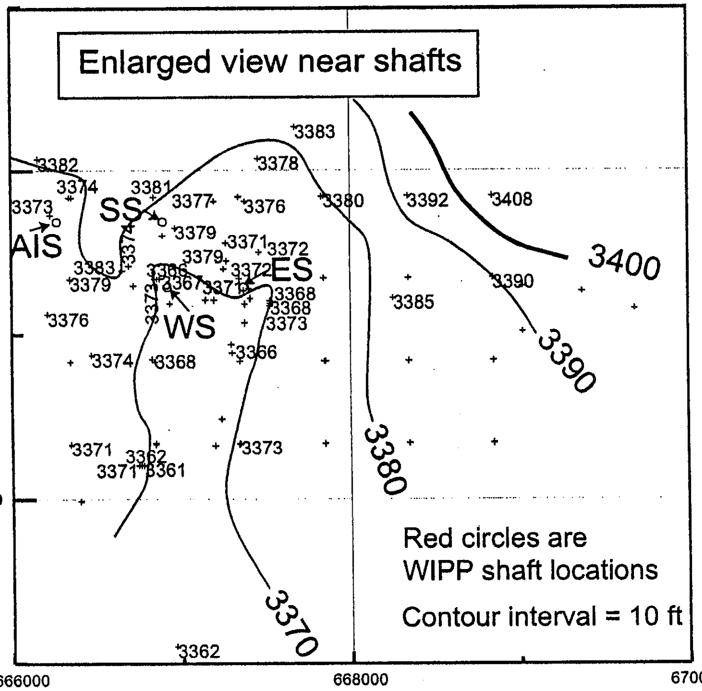
5. "*It is noted that the TDS concentrations in the Barn Well are significantly lower than those in the Ranch Well. If possible, please provide an explanation for this difference*".

   Locally the TDS concentration in the Dewey Lake Redbeds Formation is highly variable due to isolated occurrence of saturation and limited recharge and mixing of freshwater.

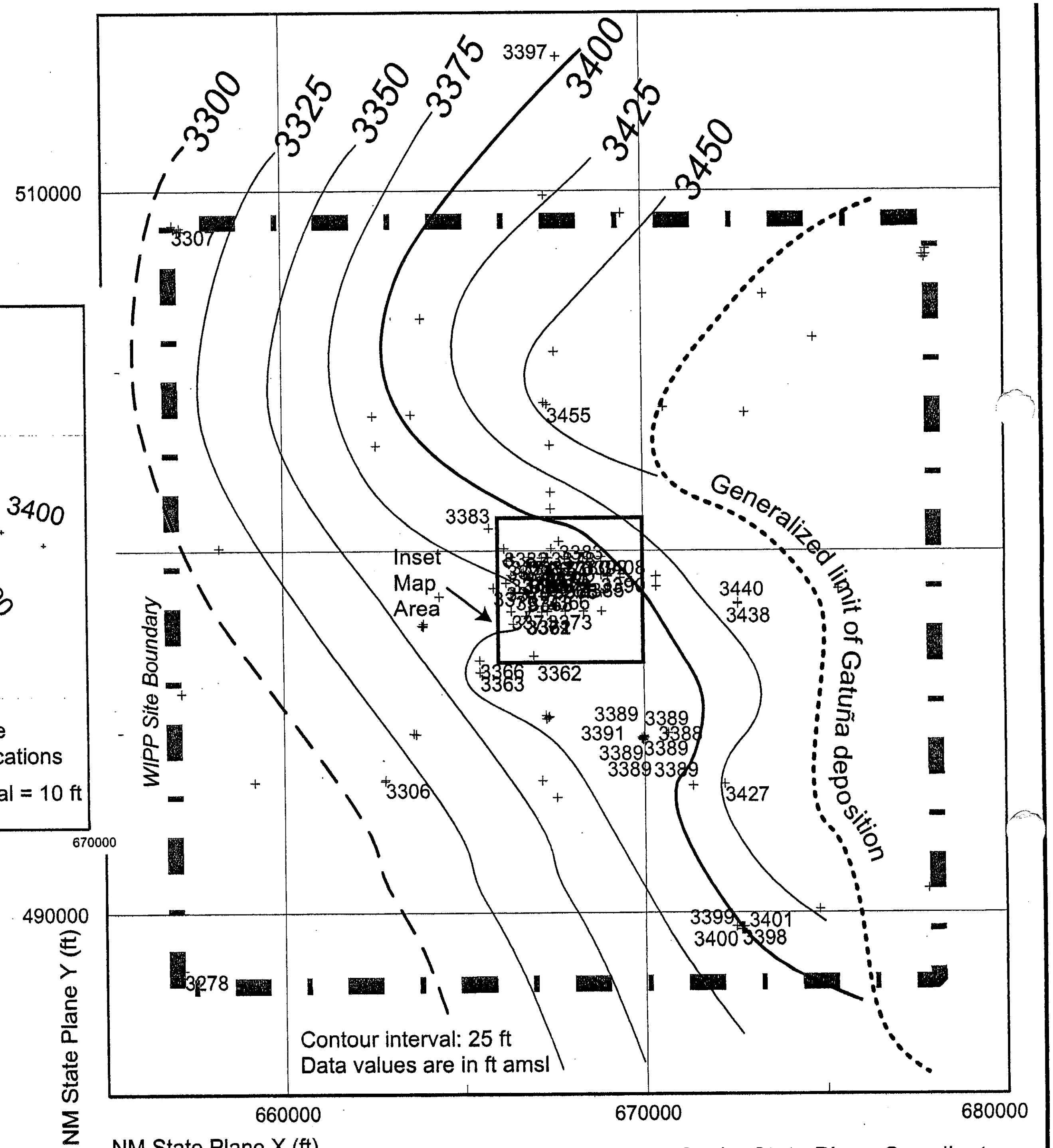
   As noted in Section 2.5.2 of the October 30, 2002 WIPP NOI, TDS concentrations are higher in the Ranch Well than the Barn Well. The Ranch Well is located on the J.C. Mill Ranch adjacent to the ranch corral and used only to water livestock. The corral is actively used for containment of livestock. The Mills Ranch also maintains livestock drinkers and water holding tanks, supplied by the Ranch Well, near the corral. The well is reported to be over 50 years of age (personal communication with Dennis Powers). The Barn Well provides water for domestic uses (WIPP CCA, Appendix USDW).

ATTACHMENT E FIGURES

Elevation (ft amsl) of (erosional) Base of Gatuña Formation in the Vicinity of WIPP



Scale: State Plane Coordinates
10,000 ft. Grids



Scale: State Plane Coordinates
2,000 ft. Grids

Figure E1
Elevation (ft amsl) of (erosional) Base of Gatuna Formation in the Vicinity of WIPP

Washington
Regulatory and Environmental Services

Thickness (ft) of Santa Rosa Formation in the Vicinity of WIPP

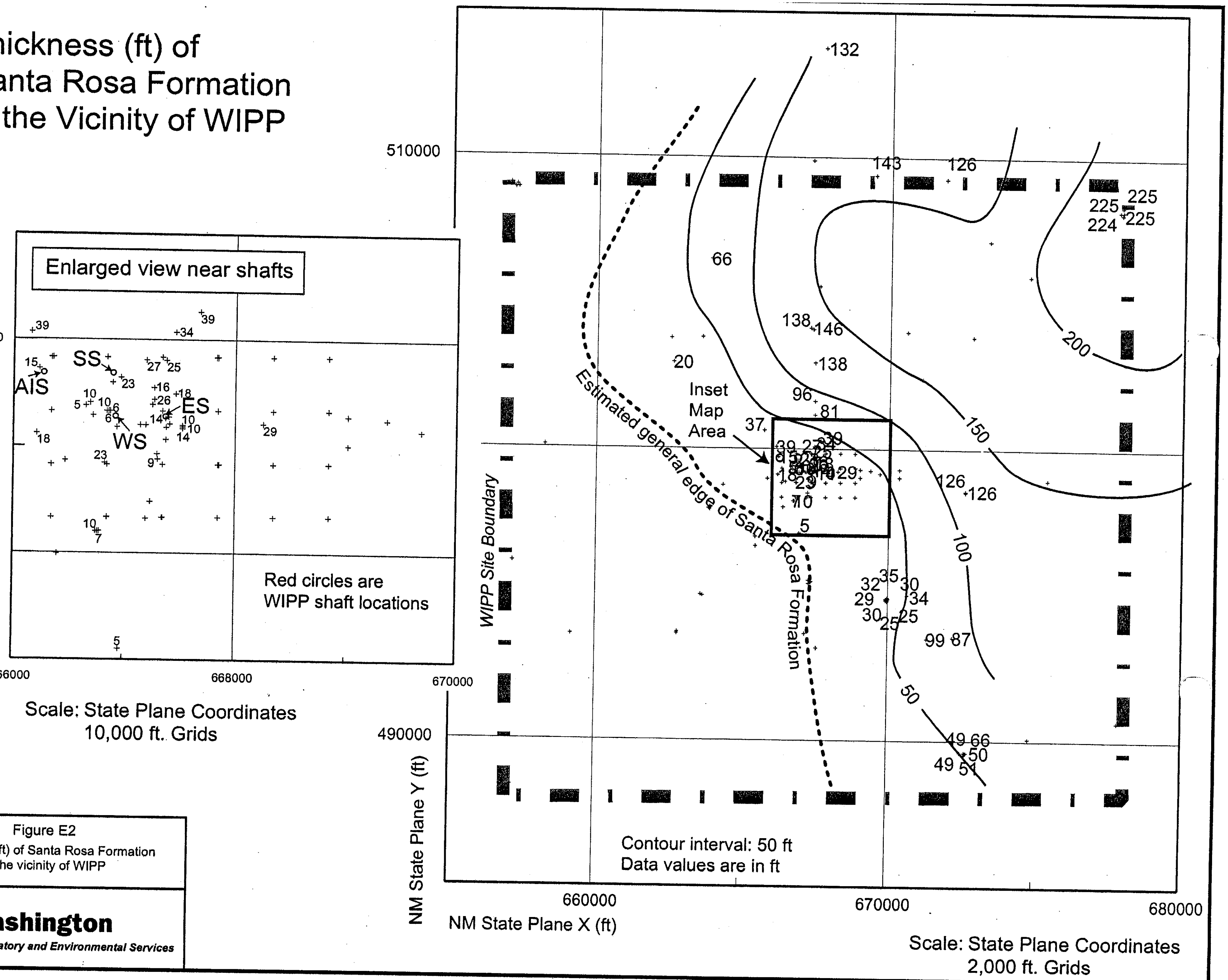


Figure E2
Thickness (ft) of Santa Rosa Formation in the vicinity of WIPP

Washington
Regulatory and Environmental Services

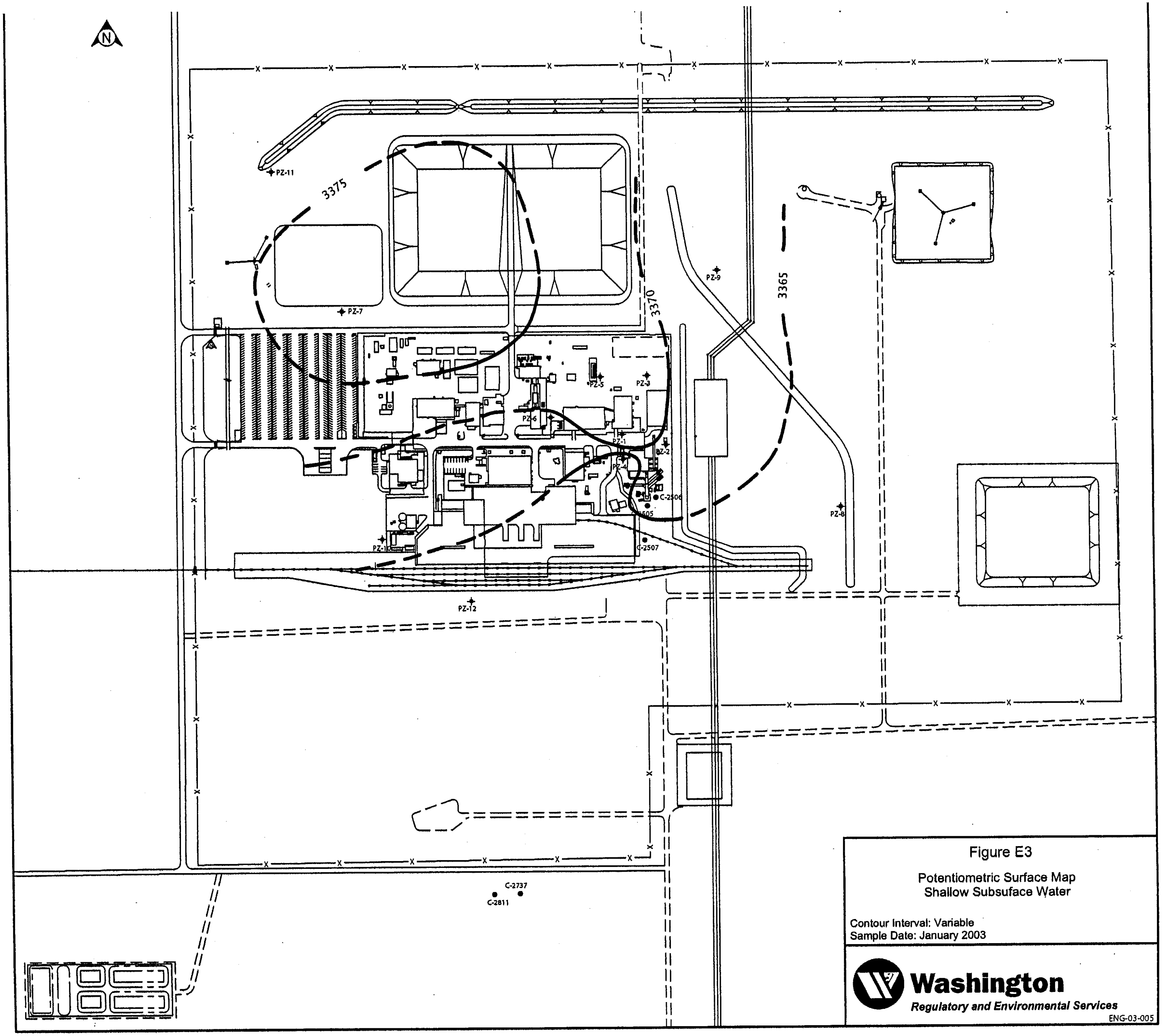


Figure E3

Potentiometric Surface Map
Shallow Subsuface Water

Contour Interval: Variable
Sample Date: January 2003

Washington
Regulatory and Environmental Services

ENG-03-005

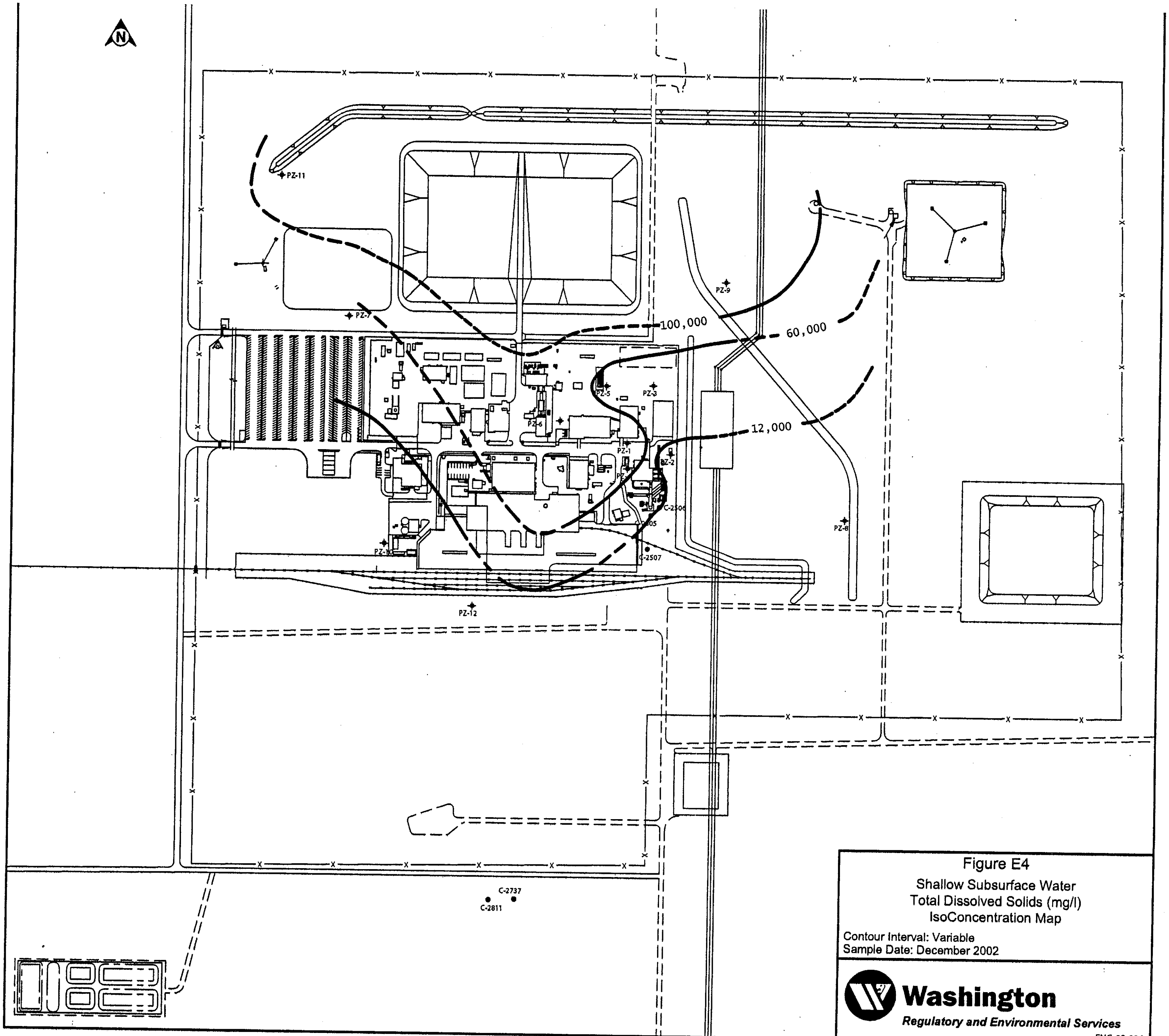


Figure E4

Shallow Subsurface Water
Total Dissolved Solids (mg/l)
IsoConcentration Map

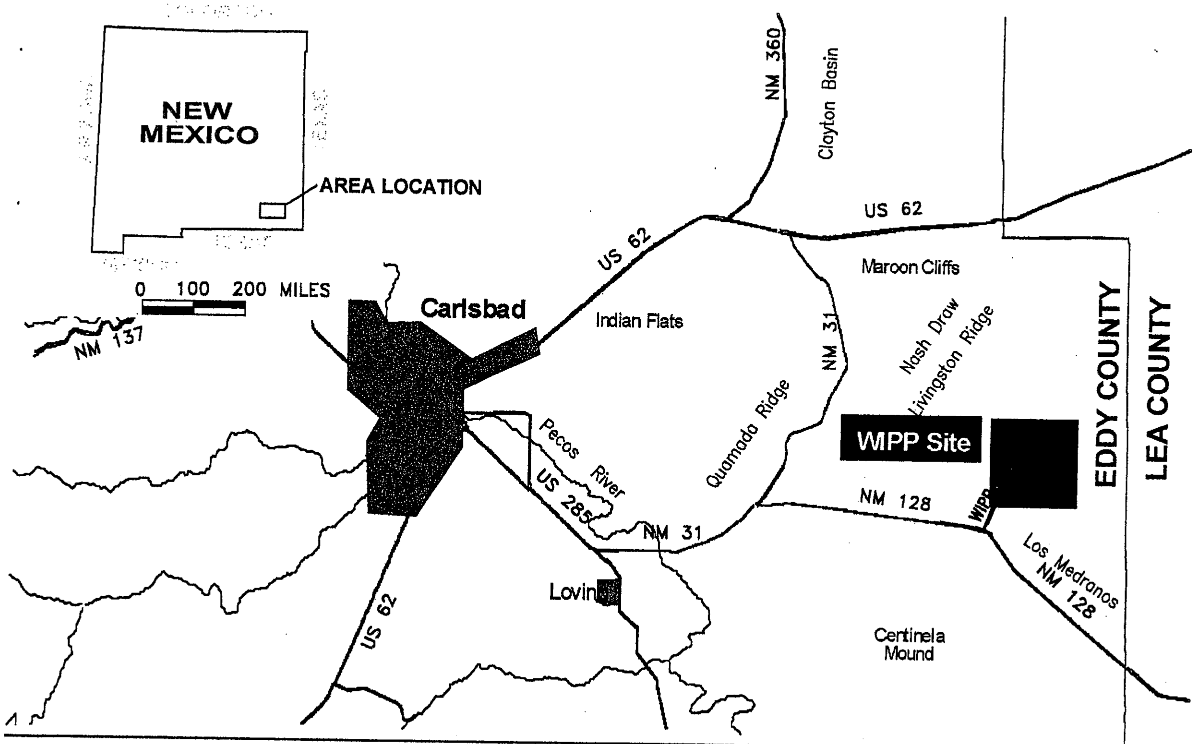
Contour Interval: Variable
Sample Date: December 2002

Washington
Regulatory and Environmental Services

ENG-03-004

WASTE ISOLATION PILOT PLANT
CONCEPTUAL DESIGN FOR INFILTRATION CONTROLS

EDDY COUNTY, NEW MEXICO
APRIL 2003



ADAPTED FROM DBSA 03/03

SITE LOCATION MAP

0 2.5 5 MILES

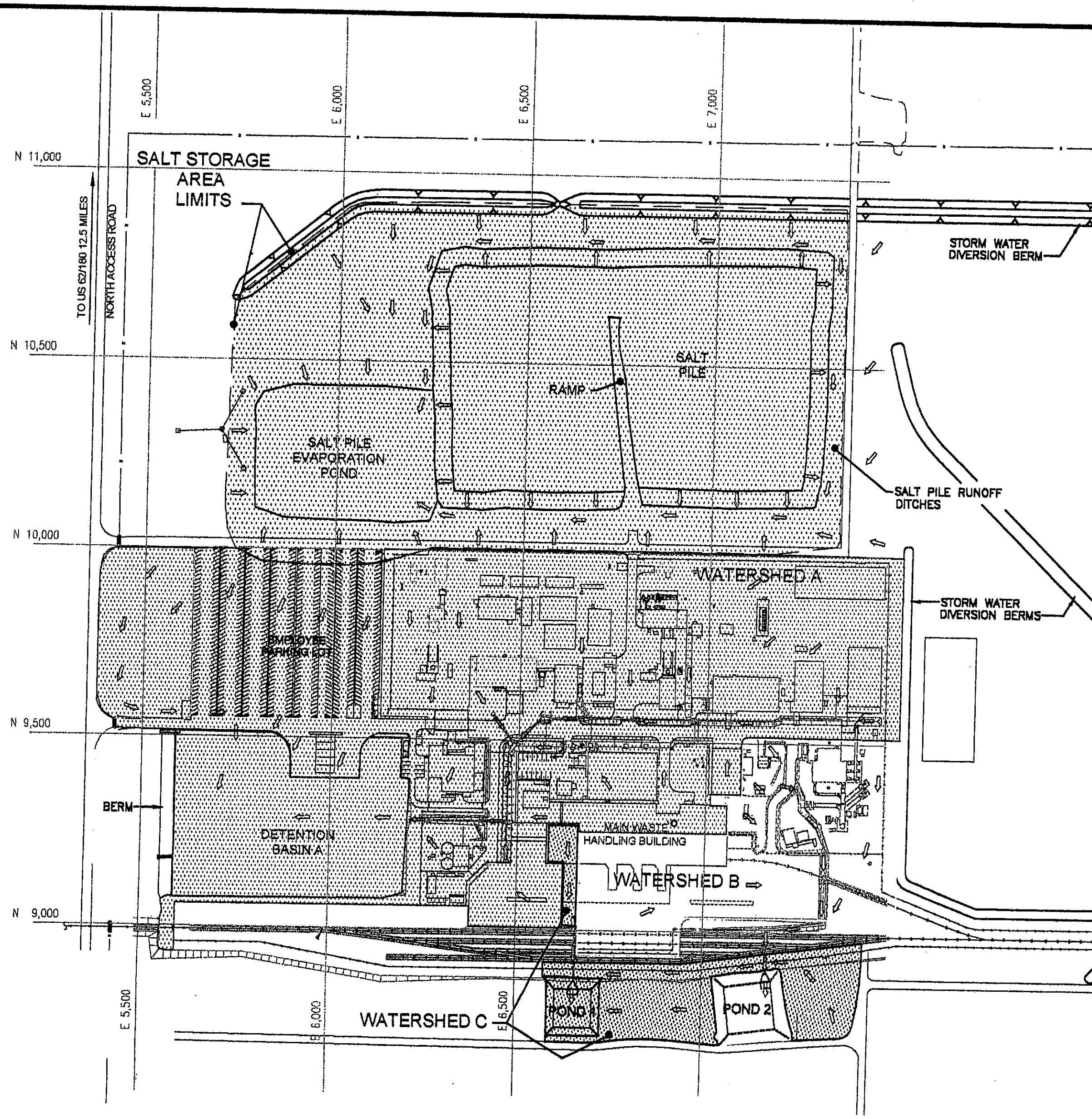
DRAWING INDEX

1 SITE LOCATION MAP AND DRAWING INDEX
2 EXISTING SITE CONDITIONS
3 PROPOSED INFILTRATION CONTROLS
4 SALT STORAGE AREA – SITE IMPROVEMENTS
5 SALT STORAGE PILE – S–N CROSS SECTION
6 SALT STORAGE PILE – W–E CROSS SECTION
7 SALT STORAGE EXTENSION – SITE PLAN
8 SALT STORAGE EXTENSION – S–N CROSS SECTION
9 SALT STORAGE EXTENSION – W–E CROSS SECTION
10 ENGINEERING DETAILS
11 DRAINAGE DETAILS
12 SALT STORAGE AREA GRADING PLAN

WIPP SITE
INFILTRATION CONTROLS
SITE LOCATION MAP
AND DRAWING INDEX

GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

PREPARED BY: WBM	DATE: 04/22/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD:COVSHT_INDEX.dwg	DRAWING 1



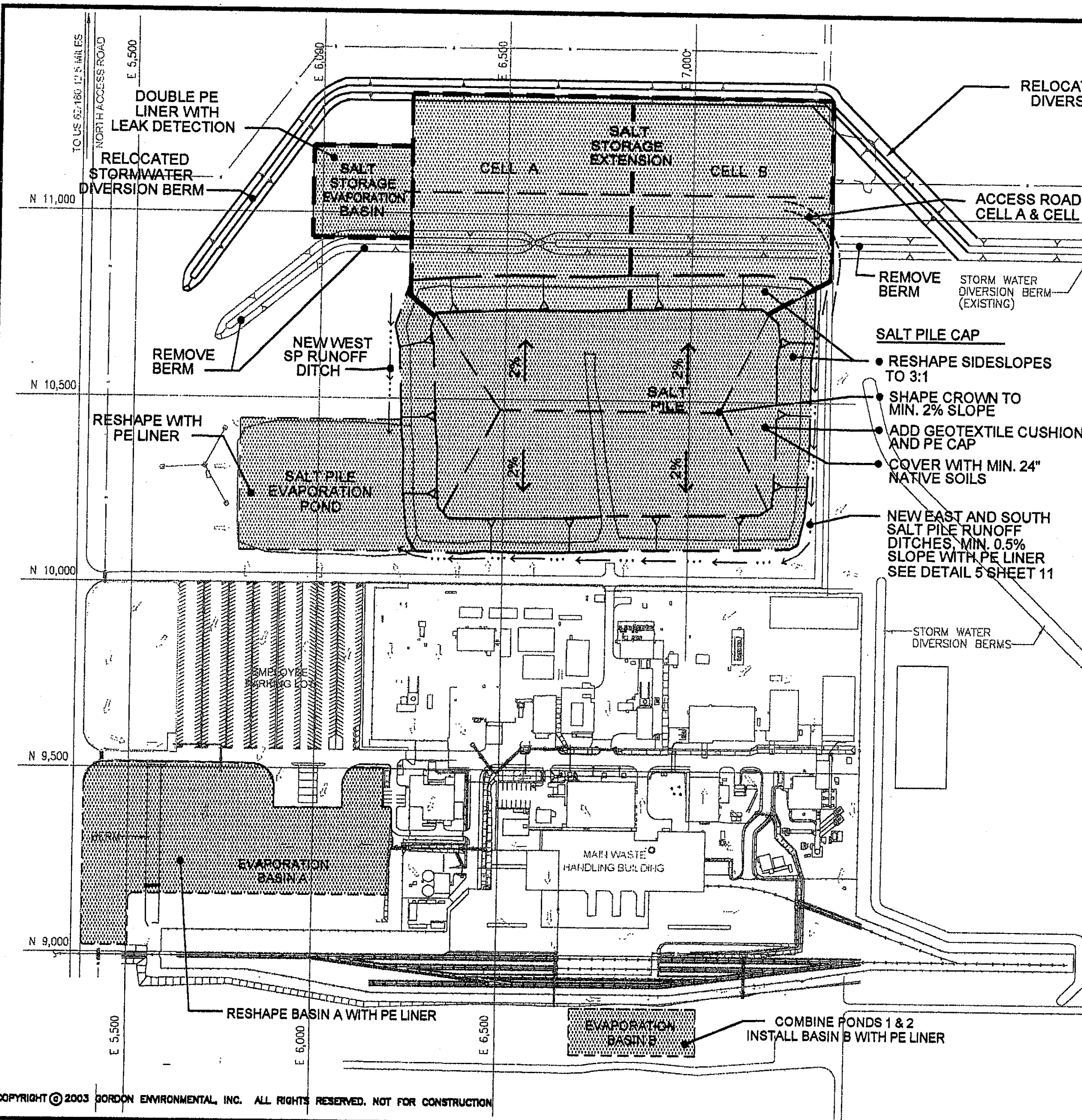
DRAINAGE UNITS		
SALT STORAGE AREA	SSA	35.0 Acres
• Salt Pile	SP	16.8 Acres
• Salt Pile Evaporation Basin	SPEP	3.5 Acres
• Salt Pile Run-Off Ditches	SPRD	1.5 Acres
• Tributary Areas		13.2 Acres
WATERSHED A		37.7 Acres
• Detention Basin A	A	5.7 Acres
WATERSHED B		8.1 Acres
• Pond 2	2	0.8 Acres
WATERSHED C		3.6 Acres
• Pond 1	1	0.5 Acres

ADAPTED FROM DBSA 03/03

WIPP SITE
INFILTRATION CONTROLS
EXISTING SITE CONDITIONS

GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

PREPARED BY: WBM	DATE: 04/22/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD:EXIST_SITE.dwg	DRAWING 2



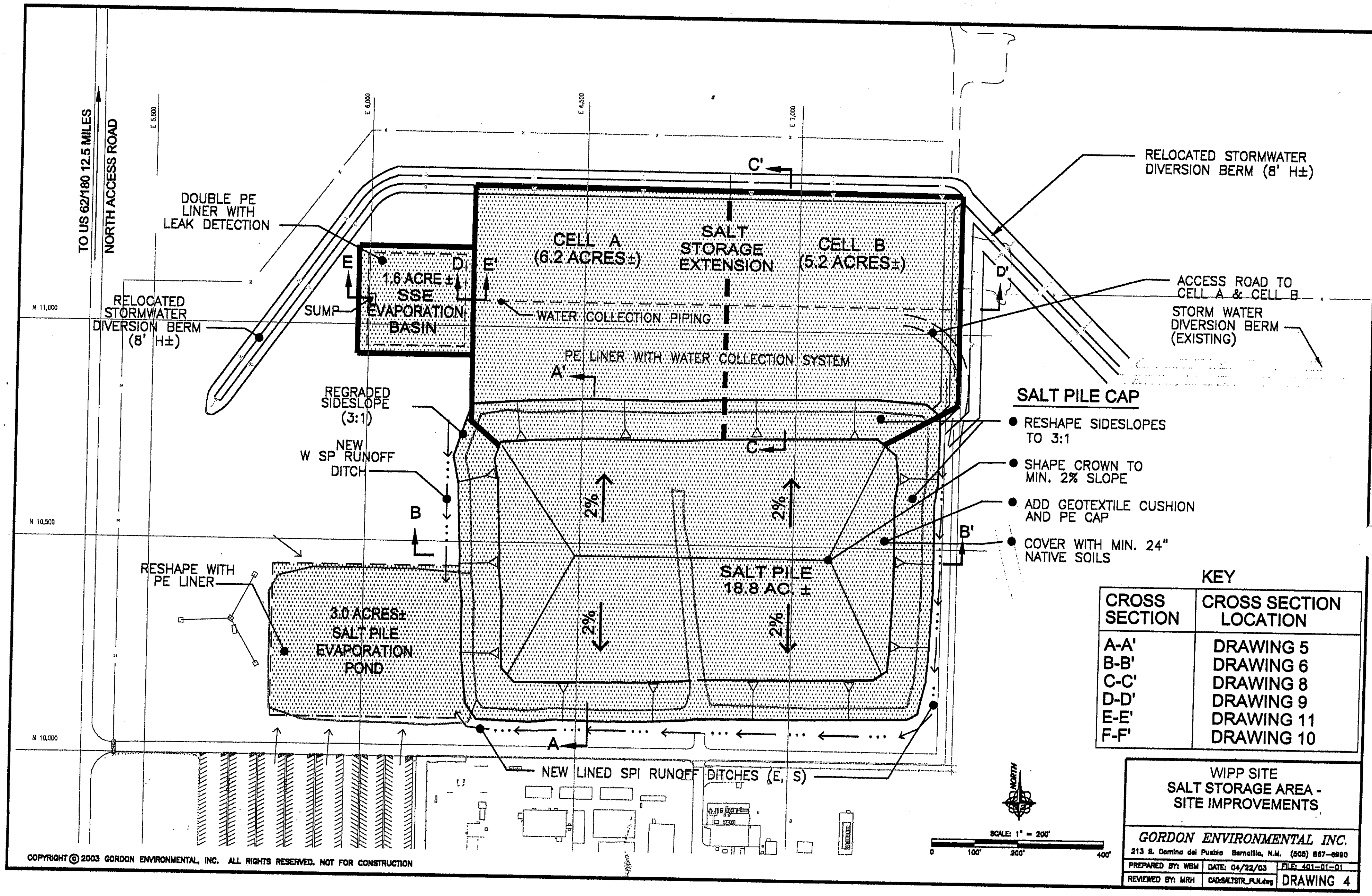
INFILTRATION CONTROLS UNITS

	Controls	Size (Ac)
SALT STORAGE AREA		
• Salt Pile	PE Cap/Soils Cover	18.6
• SPEP	PE LINER	3.0
• SPED	PE LINER	1.0
SALT STORAGE EXTENSION		
• Cell A	PE Liner with water collection	6.2
• Cell B	PE Liner with water collection	5.2
• Salt Storage Evaporation Basin	Double PE Liner with leak detection	1.6
EVAPORATION BASIN A	PE Liner	7.8
EVAPORATION BASIN B	PE Liner	2.0

WIPP SITE
PROPOSED INFILTRATION CONTROLS

GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

PREPARED BY: WBM	DATE: 04/22/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD:PROPSD_SITE.dwg	DRAWING 3



TO US 62/180 12.5 MILES
NORTH ACCESS ROAD
DOUBLE PE LINER WITH LEAK DETECTION
RELOCATED STORMWATER DIVERSION BERM (8' H±)
SUMP
1.6 ACRE ± SSE EVAPORATION BASIN
CELL A (6.2 ACRES±)
SALT STORAGE EXTENSION
CELL B (5.2 ACRES±)
WATER COLLECTION PIPING
PE LINER WITH WATER COLLECTION SYSTEM
RELOCATED STORMWATER DIVERSION BERM (8' H±)
ACCESS ROAD TO CELL A & CELL B
STORM WATER DIVERSION BERM (EXISTING)
REGRADED SIDESLOPE (3:1)
NEW W SP RUNOFF DITCH
RESHAPE WITH PE LINER
3.0 ACRES± SALT PILE EVAPORATION POND
SALT PILE 18.8 AC. ±
2%
NEW LINED SPI RUNOFF DITCHES (E, S)
SALT PILE CAP
RESHAPE SIDESLOPES TO 3:1
SHAPE CROWN TO MIN. 2% SLOPE
ADD GEOTEXTILE CUSHION AND PE CAP
COVER WITH MIN. 24" NATIVE SOILS
A A' B B' C C' D D' E E'
E 5,500
E 6,000
E 6,500
E 7,000
N 11,000
N 10,500
N 10,000
KEY
CROSS SECTION | CROSS SECTION LOCATION
A-A' DRAWING 5
B-B' DRAWING 6
C-C' DRAWING 8
D-D' DRAWING 9
E-E' DRAWING 11
F-F' DRAWING 10
NORTH
SCALE: 1" = 200'
0 100' 200' 400'
WIPP SITE
SALT STORAGE AREA - SITE IMPROVEMENTS
GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990
PREPARED BY: WBM
DATE: 04/22/03
FILE: 401-01-01
REVIEWED BY: MRH
CAD:SALTSTR_PLN.dwg
DRAWING 4
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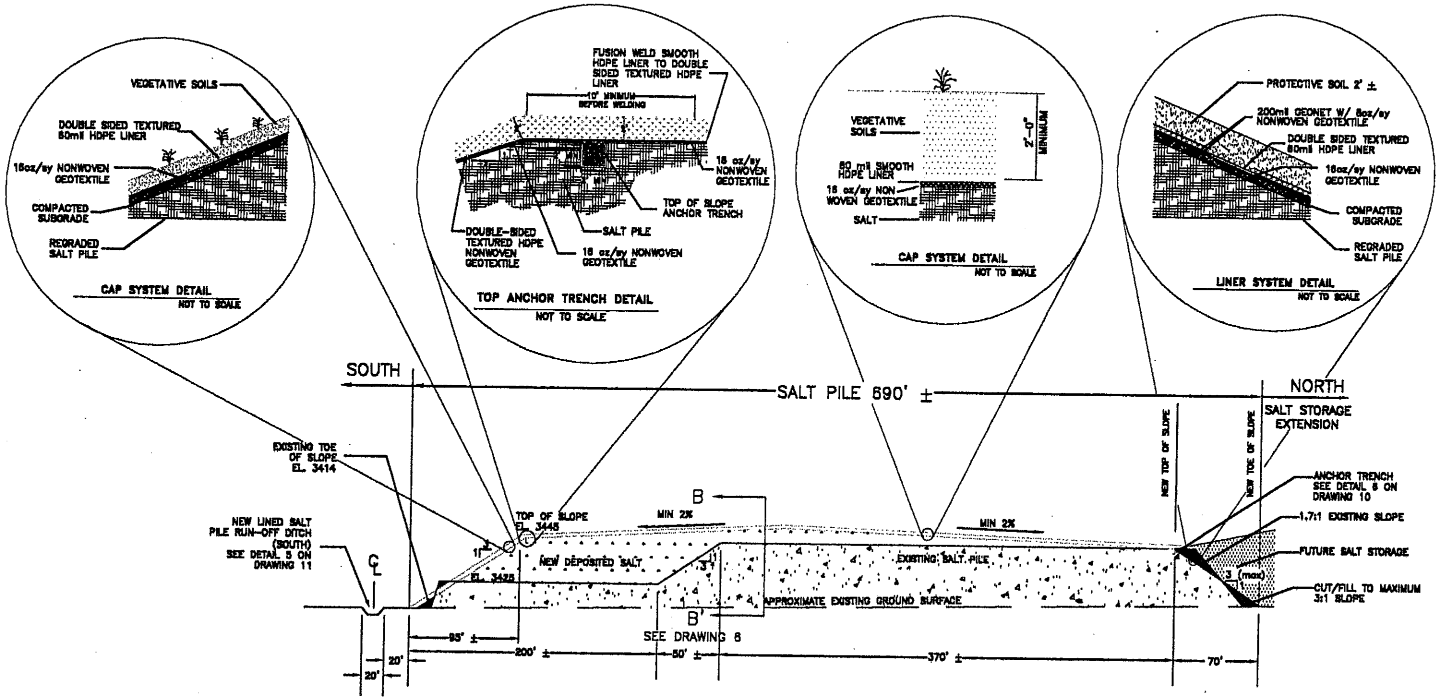
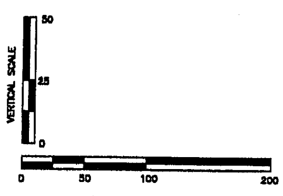
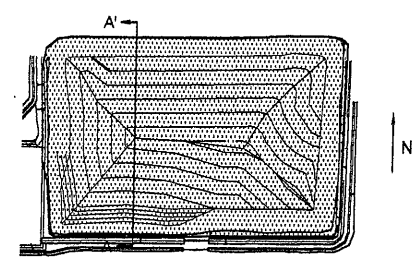


SECTION A - A'

SALT STORAGE PILE: SOUTH-NORTH CROSS SECTION

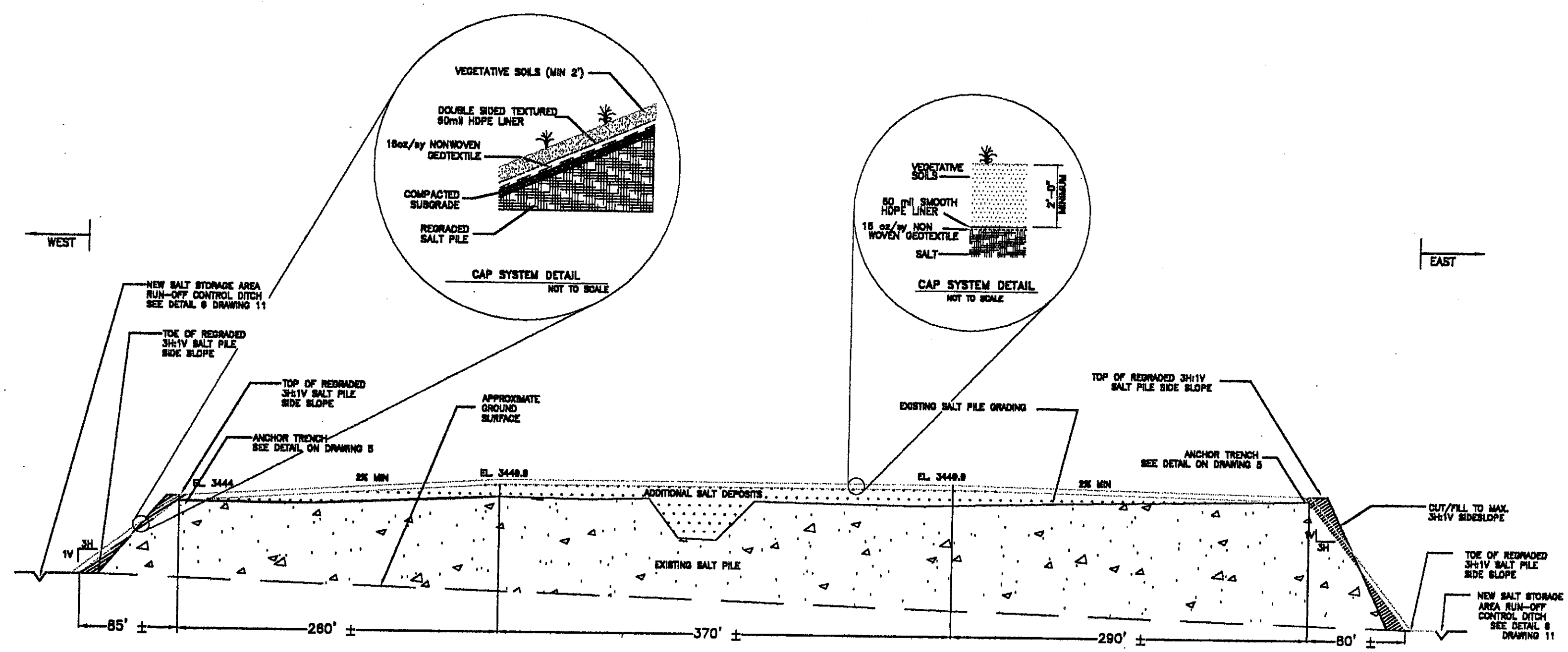




WIPP SITE
SALT STORAGE PILE -
S-N CROSS SECTION

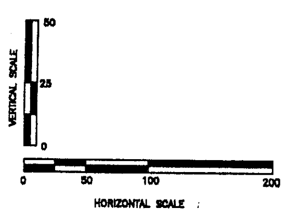
GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

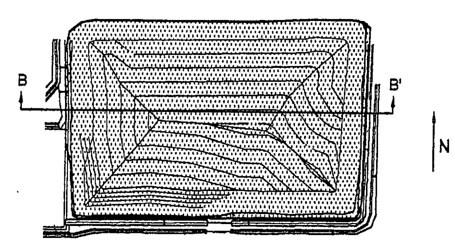
PREPARED BY: VH	DATE: 04/22/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD: SSP_SN.dwg	DRAWING 5



SECTION B-B'

SALT STORAGE PILE: WEST-EAST CROSS SECTION

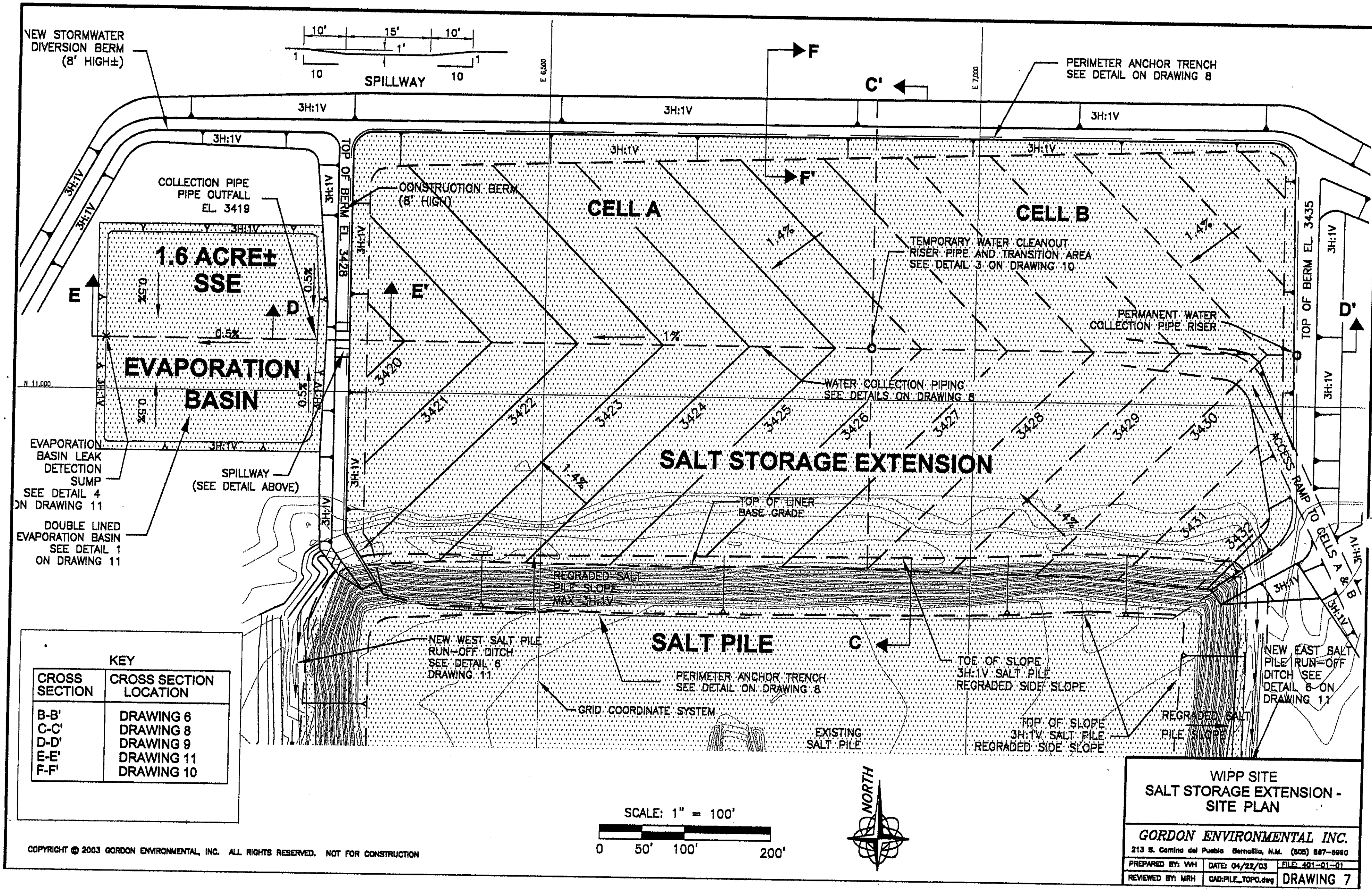




WIPP SITE
SALT STORAGE PILE -
W-E CROSS SECTION

GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

PREPARED BY: WH	DATE: 04/22/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD: SSP_WE.dwg	DRAWING 6



KEY

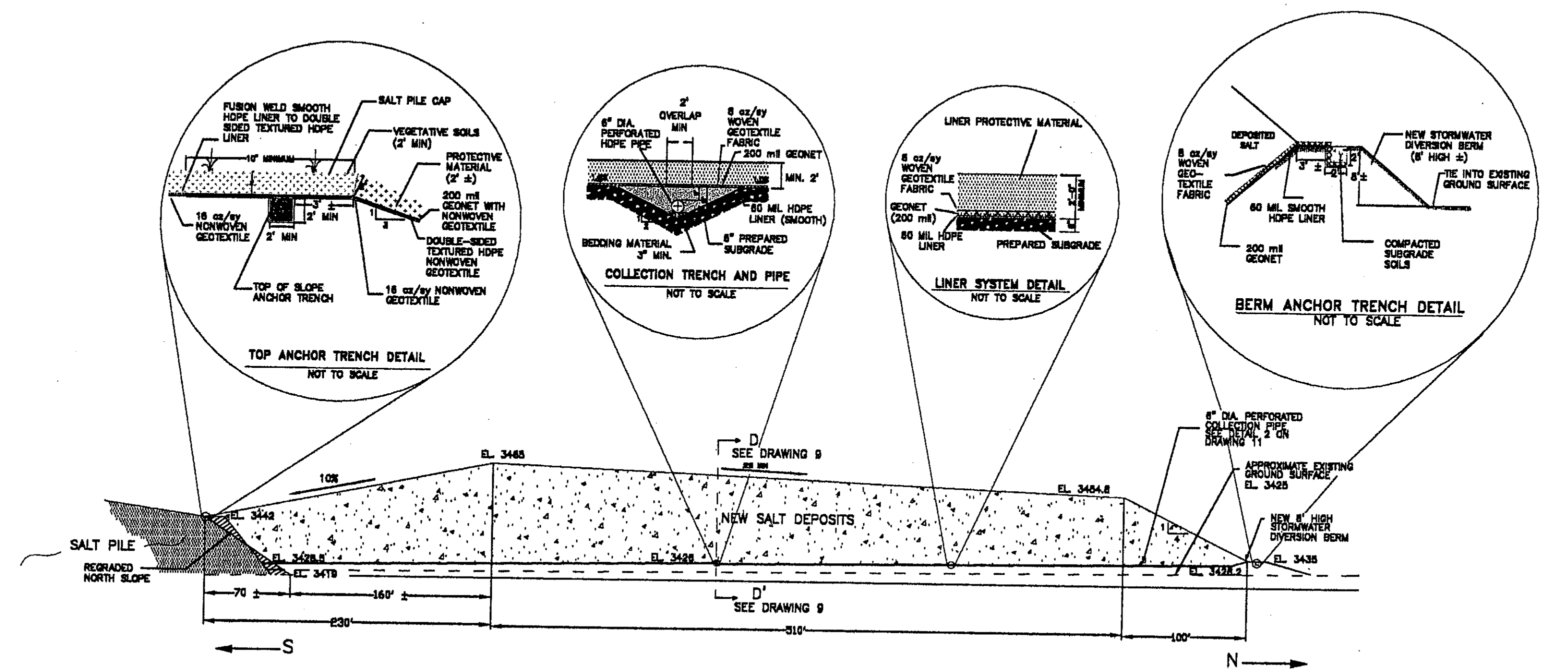
CROSS SECTION	CROSS SECTION LOCATION
B-B'	DRAWING 6
C-C'	DRAWING 8
D-D'	DRAWING 9
E-E'	DRAWING 11
F-F'	DRAWING 10

WIPP SITE
SALT STORAGE EXTENSION - SITE PLAN

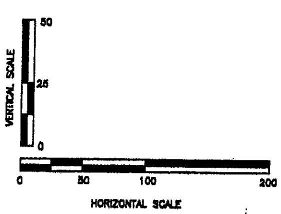
GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

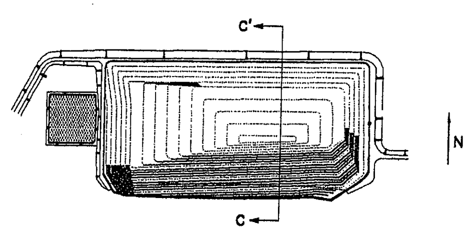
PREPARED BY: WH	DATE: 04/22/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD:PILE_TOPO.dwg	DRAWING 7

SALT STORAGE EXTENSION



SECTION C' - C
SALT STORAGE EXTENSION- SOUTH TO NORTH CROSS SECTION



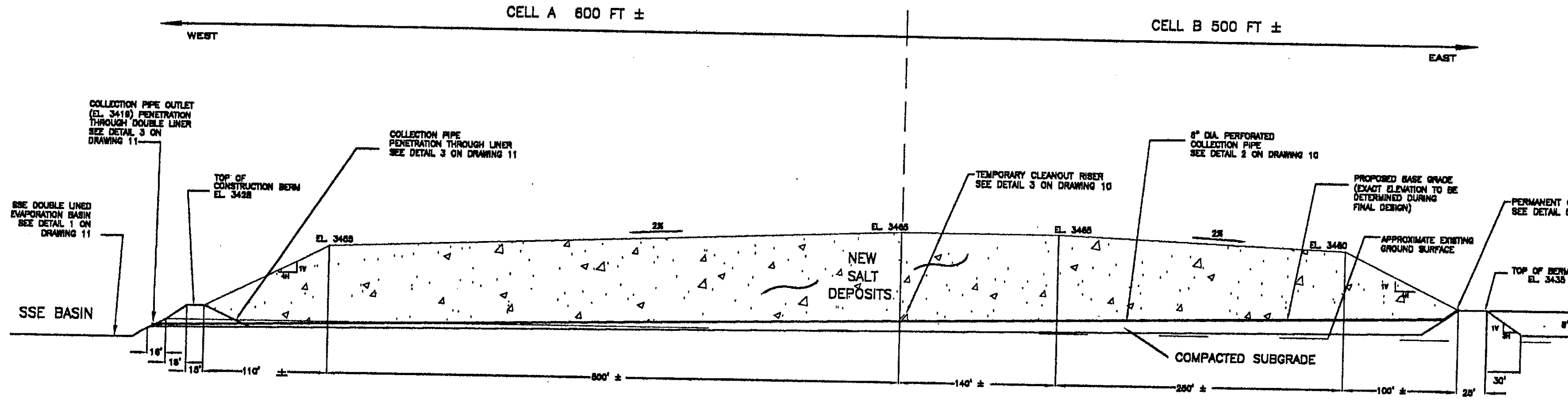


WIPP SITE
SALT STORAGE EXTENSION - S-N CROSS SECTION

GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

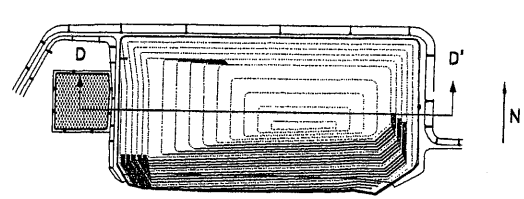
PREPARED BY: WH	DATE: 04/22/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD:CRS_SECTION.dwg	DRAWING 8

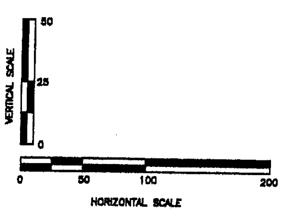
SALT STORAGE EXTENSION



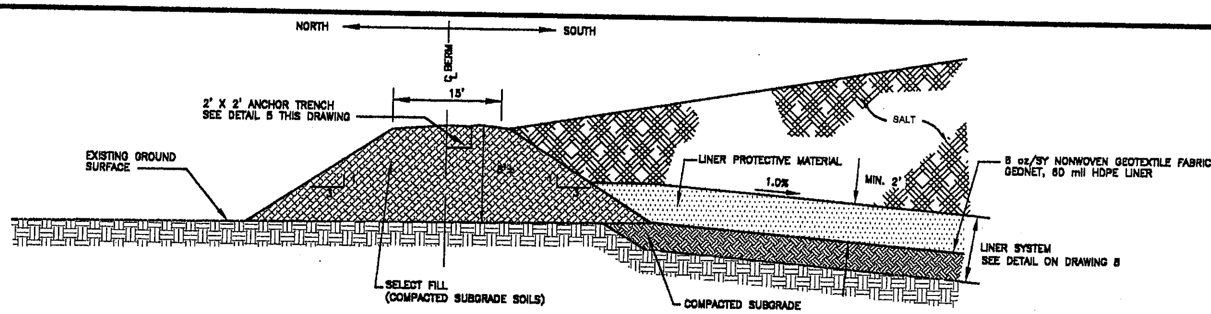
SECTION D - D'

SALT STORAGE EXTENSION - WEST-EAST CROSS SECTION

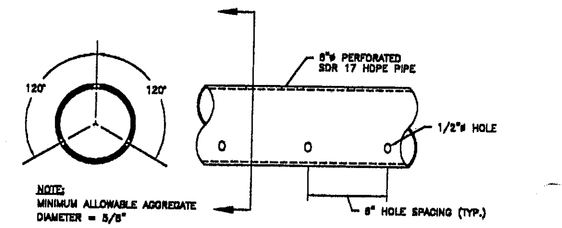




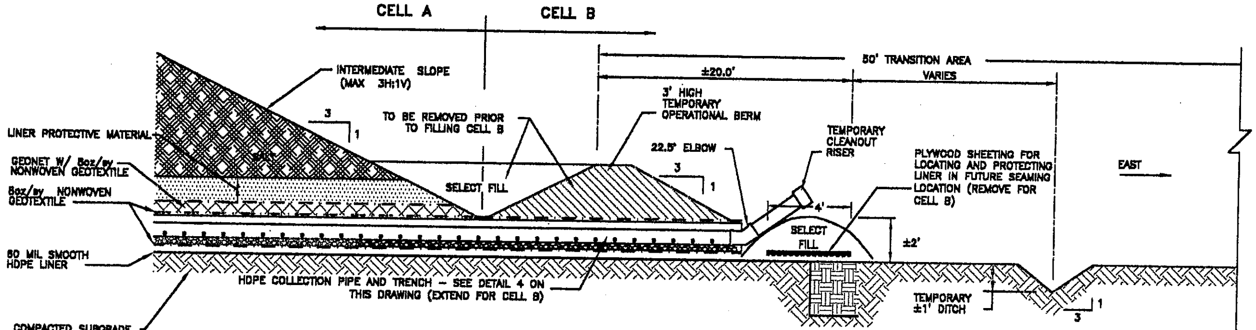
WIPP SITE SALT STORAGE EXTENSION – W–E CROSS SECTION	
GORDON ENVIRONMENTAL INC. 213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990	
PREPARED BY: VVH | DATE: 04/22/03	FILE: 401.01.01
REVIEWED BY: MRH | CAD: SSE_WE.dwg	DRAWING 9



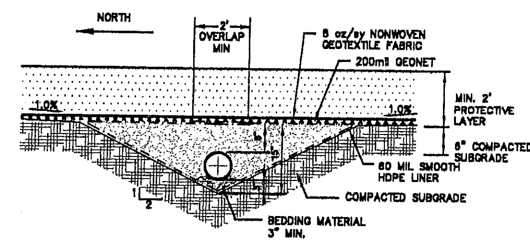
(1/10) STORM WATER DIVERSION BERM
SECTION F–F' NOT TO SCALE



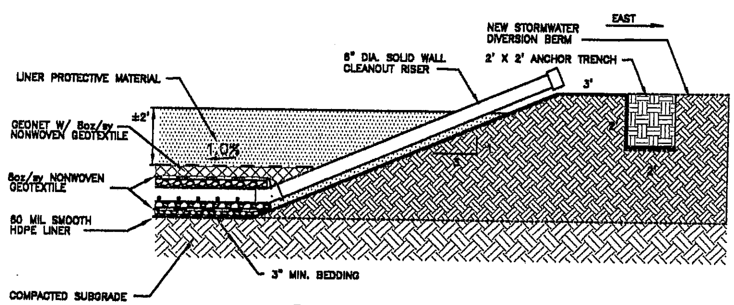
(2/10) PERFORATED COLLECTION PIPE
NOT TO SCALE



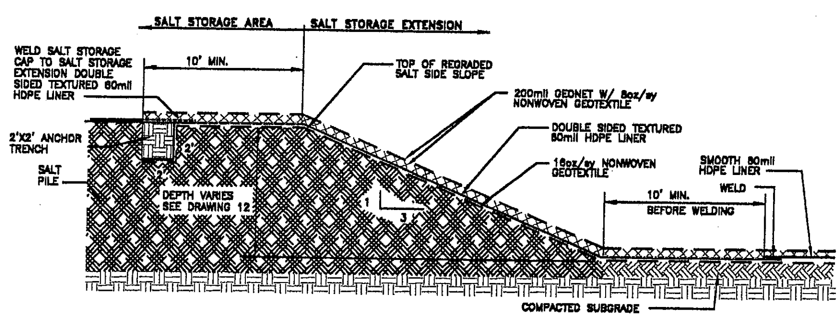
(3/10) TEMPORARY CLEANOUT RISER
SECTION VIEW NOT TO SCALE



(4/10) HDPE COLLECTION PIPE AND TRENCH
SECTION VIEW NOT TO SCALE



(5/10) PERMANANT CLEANOUT RISER
SECTION VIEW NOT TO SCALE



(6/10) SALT STORAGE AREA
REGRADED NORTH SIDE SLOPE
SECTION VIEW NOT TO SCALE

WIPP SITE
SALT STORAGE EXTENSION
ENGINEERING DETAILS

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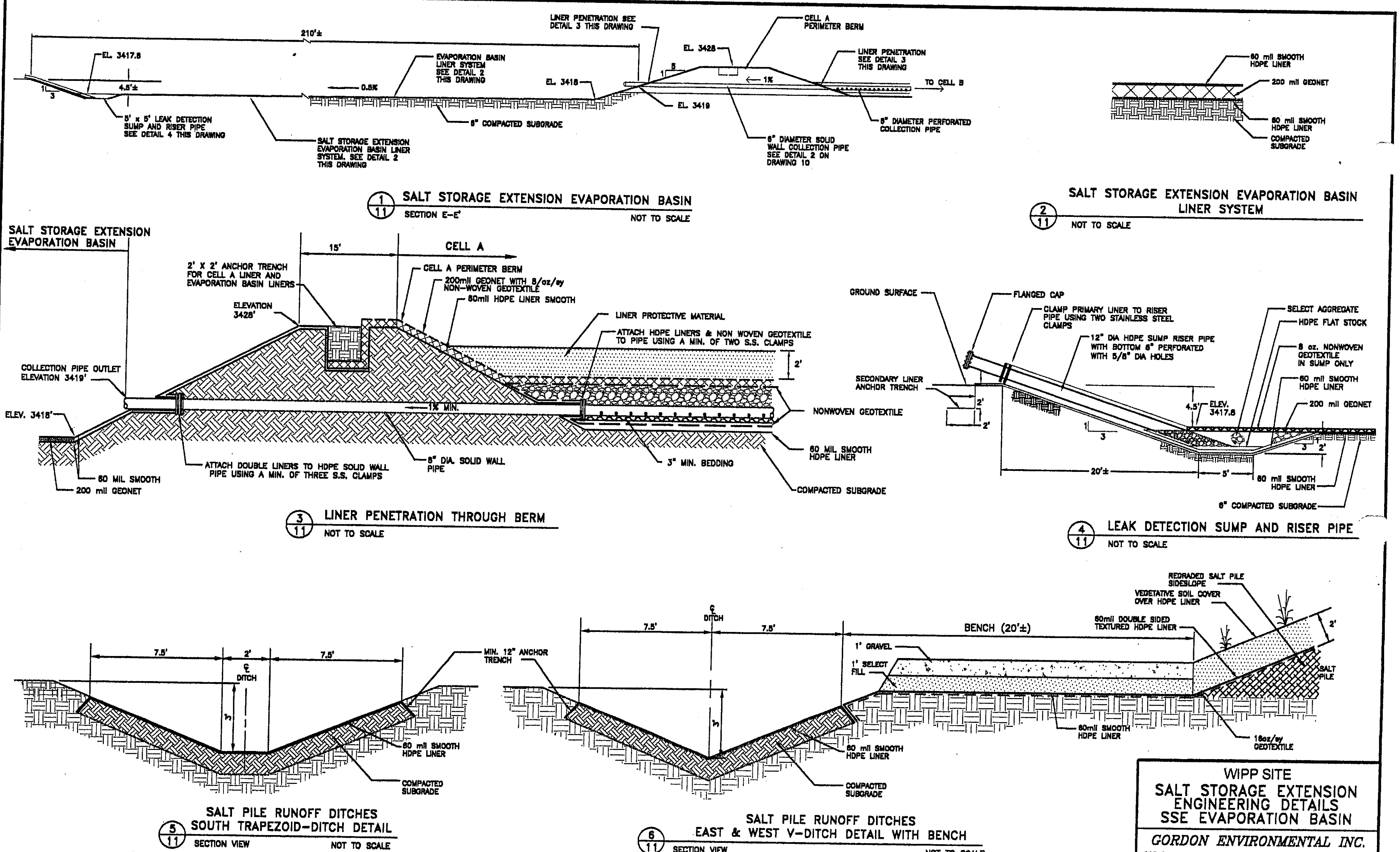
PREPARED BY: VH	DATE: 04/22/03	FILE: 401.01.01
REVIEWED BY: MRH	CAD: Linedets4a_1	DRAWING 10



WIPP SITE
SALT STORAGE EXTENSION
ENGINEERING DETAILS
SSE EVAPORATION BASIN

GORDON ENVIRONMENTAL INC.
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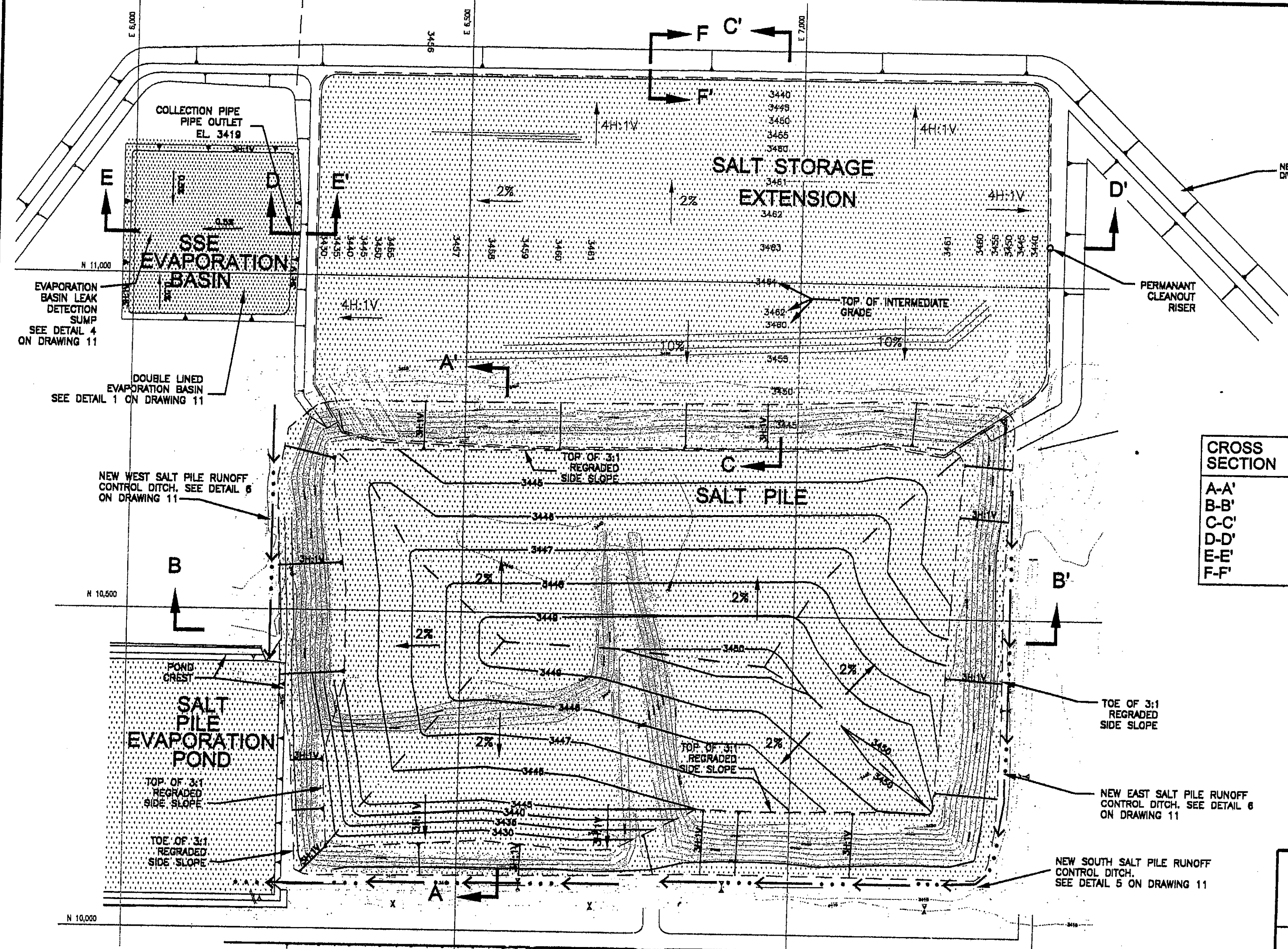
PREPARED BY: VWH	DATE: 04/22/03	FILE: 401.01.01
REVIEWED BY: MRH	CAD:drnage_dtl.dwg	DRAWING 11



KEY

CROSS SECTION	CROSS SECTION LOCATION
A-A'	DRAWING 5
B-B'	DRAWING 6
C-C'	DRAWING 8
D-D'	DRAWING 9
E-E'	DRAWING 11
F-F'	DRAWING 10

WIPP SITE
SALT STORAGE AREA
GRADING PLAN

GORDON ENVIRONMENTAL INC.
213 S. Camino del Pueblo Bernalillo, N.M. (505) 867-6990

PREPARED BY: WH	DATE: 04/18/03	FILE: 401-01-01
REVIEWED BY: MRH	CAD: S_Pile_grades.dwg	DRAWING 12